

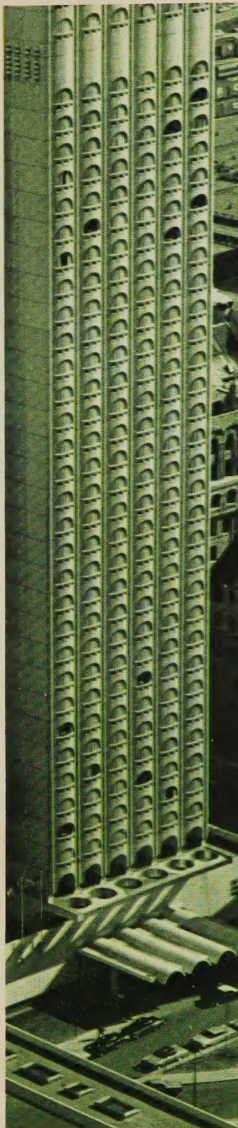
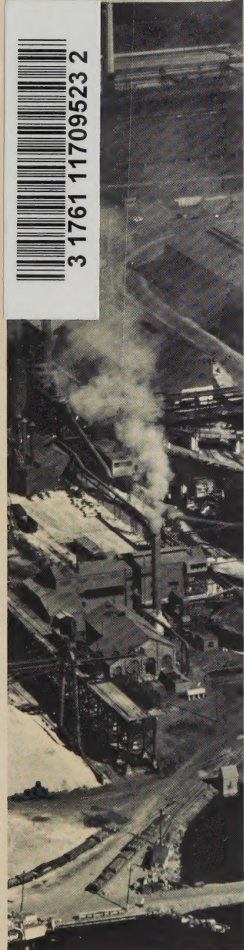
Town Planning Guidelines

Department of Public Works Canada

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Town Planning

TOWN PLANNING GUIDELINES



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Town Planning Guidelines

By
F.A. Schwilgin
B.Arch., M.Arch.(C.P.)

Department of Public Works
Ottawa
1973

Acknowledgments

Credits

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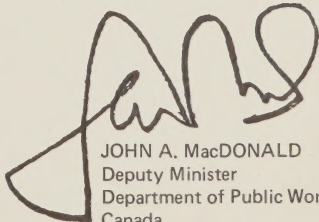
Authority for planning and development controls is allocated to the Provinces in accordance with the British North America Act — Canada's Constitution. Nevertheless, the Government of Canada undertakes the moral, if not legal, responsibility of coordinating federal construction programs with the short- and long-range plans of provincial, municipal and even private interests; hence the mandate of the town planning function in the federal Department of Public Works (DPW).

DPW officials are not as a rule trained in the professional field of town planning. Only a few officers employed at Headquarters in Ottawa provide consulting services to all DPW offices across the country. Important large-scale projects in the urban areas of Canada receive town-planning assessment and coordination. Smaller projects, however, are handled by DPW offices without specialist town-planning resources.

The guidelines and principles in this book, by F.A. Schwilgin, Chief, Town Planning, are offered as a means of identifying and understanding problems likely to be encountered in urban areas in the fulfilment of our responsibilities, thereby helping to create better urban conditions for Canadians in general.

This publication, however, must not be regarded as a definitive departmental manual outlining standard procedure. Administrative aspects within the department are changing rapidly as a result of an ongoing reorganization. The book therefore contains no policy statement as such, but it does provide professional guidelines for the daily user by presenting town planning data and principles as they apply to the department's activities in the urban environment.

Canada's urban areas are our real frontiers. It is in these areas that we observe the intensive daily activities of many people, the growth of built-up areas, and the continual shifting of our social and physical environment. Town-planning requirements must be fulfilled even if town planners do not participate directly in the design or managing of a given program. The importance of guidelines for both public and private users will therefore be obvious.



JOHN A. MacDONALD
Deputy Minister
Department of Public Works
Canada

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Introduction

10

In order to make the best use of the guidelines in this book it is necessary to provide a general definition of the town planning function. There are, of course, several interpretations, but not one of them is really definitive because of the continual shifting of goals brought about by the problems and scale of our urban environment. However, so long as the problems are borne in mind, a general definition of town planning will serve its purpose in the early stages of the discussion of this subject.

The best and, perhaps, most up-to-date general definition is the one adopted by the Town Planning Institute of Canada:

"Town planning means the planning of the scientific, aesthetical and orderly disposition of land, buildings and amenities in use and development with a view to securing physical, economical and social efficiency, health and well-being in urban and rural communities".

Nevertheless, an understanding of all the implications will not necessarily result in perfect agreement with what is the best concept for the development of our urban environment. Corporations and agencies, families and individuals, young and old, men and women, each have different outlooks, attitudes and needs. These outlooks, attitudes and needs are made apparent in the policies and objectives of institutions, and the social, physical and psychological make-up of the individual. In the sense that the characteristics of any two individuals are never absolutely identical, so the amenities and characteristics of an urban environment are, at best a compromise between perfection and reality.

Consequently, the town-planner must not only concentrate on the attitudes and needs of the individual, but also on the mass of people, in terms of creating an organised environment in which the cultural values of the society will flourish. In this respect, he must also concern himself with overriding climatic influences and the geographical aspects of a given region.

Briefly, with these thoughts in mind, it will be evident that no completely uniform standards in town-planning can be applied to federal construction in the many different parts of Canada. It is one of the

main purposes of this publication to discuss these aspects in some detail.

In general, the discussion will be focused on the basic objectives which, for the most part, appear to be desirable for the majority of people in relation to urban development. For the convenience of the reader, a number of highlights, indicating the kind of practical action that can be taken in achieving these objectives, is appended at the end of each chapter.

It should also be noted that the principles and criteria in the guidelines should be used selectively because federal construction projects often vary in both type and size. Individual judgement and personal discretion should be exercised in adopting any combination of guidelines for theoretical and practical purposes. The reason for this is that the guidelines

are themselves subject to significant limitations imposed by controls that are essential to orderly planning in a changing society.

These restraints are applicable to both the public and private sectors. The federal government, however, is particularly susceptible to these restraints since it is responsible for the use of all federal real property in the interest of the country as a whole. The impact so created on the urban environment is very significant for all town planning exercises.

The attention of the reader is also directed to some serious limitations in these guidelines. These limitations were inherited from the — perhaps unfortunate — obligation to provide for present needs and controls. These restraints have to be accepted because the government must acknowledge the existence of certain static interests when providing for the needs of urban areas. It should be noted, of course, that the cities themselves are far from being static and this should be well understood. They are, indeed, the overall framework for dynamic and continually fluctuating human activities. These activities are susceptible to changes that may occur in the urban environment. Thus,



Typical Suburbia (present)

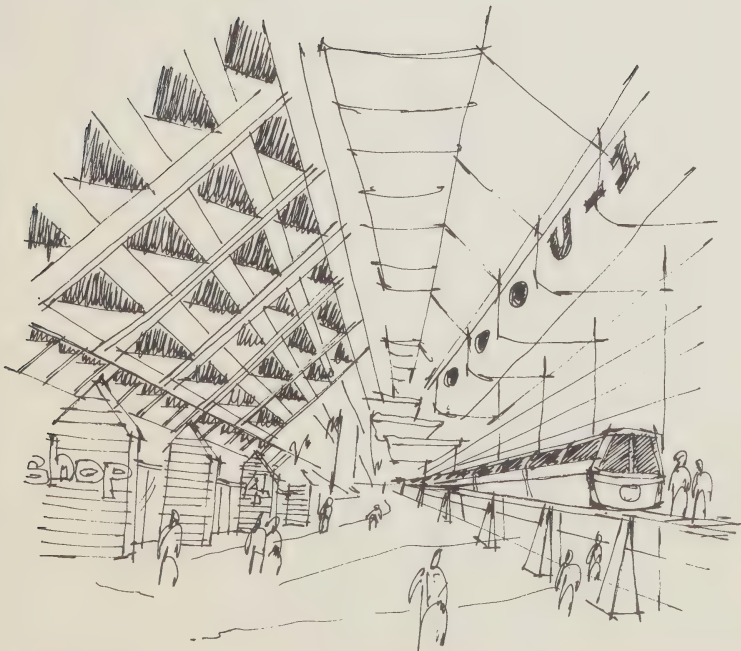
the effects of significant urban development projects on an urban population should never be underrated or ignored in planning.

In discussing town planning guidelines there is always a temptation to set out concepts of a desirable — perhaps utopian — future city. In such a future environment the dynamic activities would be recognized and aided by a set of forward-looking stimulating controls aimed at the perfection of urban life, thereby eliminating status quo conditions. And it would be convenient to forget existing and outdated building materials, techniques, transportation methods, social indifference and economic conflicts. This, however, would produce a set of guidelines for not yet existing activity patterns and would result in an unrealistic approach.

If it were possible accurately and systematically to forecast all the requirements of urban living two or three decades ahead it might be feasible to set out utopian guidelines designed to meet both interim problems and ultimate contingencies as well. However, this would pre-suppose precise foreknowledge of complex economic and technological trends, not to speak of many inter-related influences. It need not be stressed that human affairs do not march in predictable order. Nevertheless, it is to be hoped that, eventually, it will be possible to produce town planning guidelines which will not be outdated by the time they are ready for publication. Such guidelines, however, could only be applied to new urban areas where a specific development concept is introduced as a viable alternative to outdated techniques.

Meanwhile, this book is intended as a guide and the reader should remember that town planning cannot be harnessed to a fixed set of concepts. Thus, the information contained in the following pages should be equated with any new or significant developments in the philosophy of town planning subsequent to the publication of this study.

Each decision, regardless of whether it is intended for practical application or as a theoretical exercise, calls for careful judgement of all relevant factors in a given situation. In this respect, improvement of the human condition, particularly in the urban milieu, should be the paramount consideration.



Typical Suburbia (tomorrow)

Part I

Administrative Aspects



1. Planning, General

PURPOSE

Planning is not restricted to the urban areas and what it entails could be defined in a great many ways. However, the concept of planning in this book should be understood as the professional assessment of various alternatives to a given building project, concluding in specific recommendations for action. These conclusions are based on a methodological analysis of various data and background information.

The concept of town planning also includes regional-planning exercises. As a matter of interest, the term, town planning, was not introduced into the English language until 1904. This tardy use of the term was by no means due to ignorance of the importance of controlling urban growth, but symptomatic of the urgent need to deal with the chaotic conditions resulting from the Industrial Revolution. However, the term itself has been a source of confusion since its introduction because it appears to imply that its usage is confined to town planning, whereas it is really meant to encompass "town and country planning". As an organized profession, town planners are now seriously considering the introduction of a more precise term. If these implications are borne in mind, the foregoing connotation of town planning may be regarded as satisfactory for the purpose of discussion in the following chapters.

The Department of Public Works town planning guidelines, contained in this publication are applicable to federal construction in Canada's urban areas. Almost all large-scale and other important federal construction projects are located in cities. Non-urban projects in villages and regional settings are covered by other standards.

Since the *purpose* of planning is to create and maintain order and ensure systematic, coordinated development the following chapters will discuss a planning approach to various development concepts and considerations. These are summarized under the heading of "Practical Interpretations". It should be noted at the outset that the foregoing discussion is intended to indicate the final objective first so as to provide the reader with a prac-

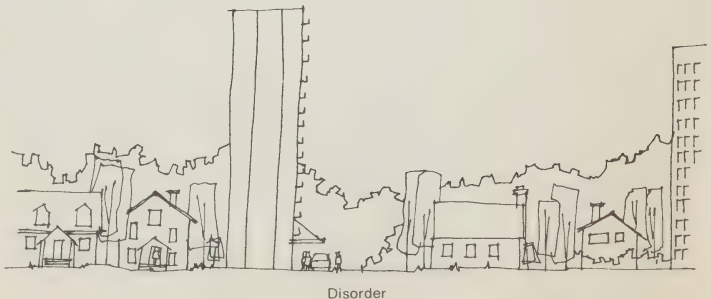
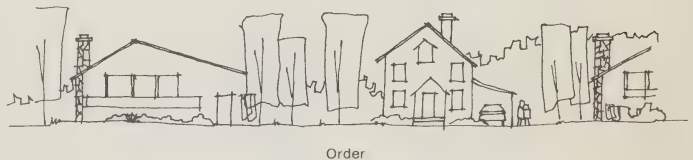
tical appreciation of the most desirable aims and goals.

In essence, the whole of the following town planning appraisal is presented not only to the interested reader but to decision-making authorities as well, so as to make them aware of the impact the projects may have on the urban milieu.

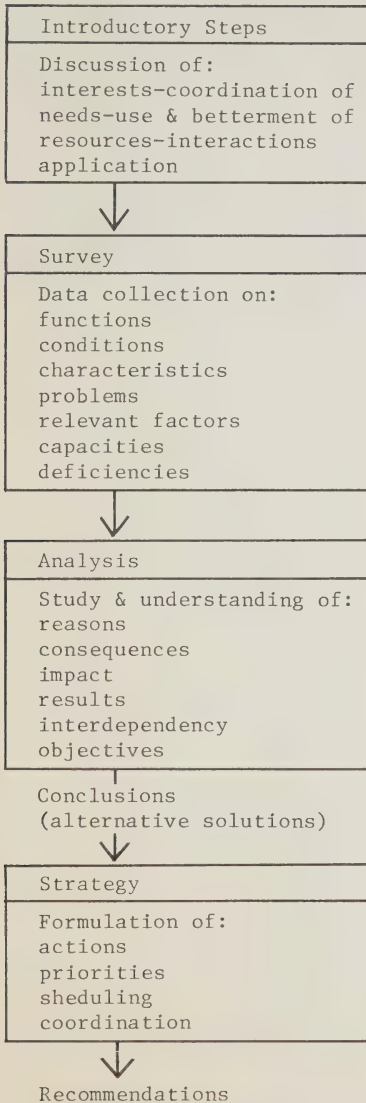
Practical Interpretations

A realistic appreciation of the nature and implications of town planning is essential to the purpose of planning investigation.

The reader should analyse the general discussion first so as to become familiar with the objectives and then make the necessary decisions along the lines suggested in one or other the series of practical interpretations included in the relevant sections.



(for Federal Buildings)



STAGES

Following introductory steps the principal stages of the planning process are, survey, analysis, conclusions (strategy).

Planning investigations are carried out in multiple stages where the proper priorities and progress are of vital importance. Regardless of either the size of the project or the existence of complications these three stages in the planning assessment should always be carried out.

When approaching a problem with the intention of studying it from the town planning point of view every effort should be concentrated on surveying and collecting all the available information and background data. This *survey* of the data should include areas adjacent to the actual location of the federal project and must incorporate major characteristics of the whole community. The processes of gathering essential information is an activity in which the offices of all three levels of the government could be involved.

The next step is the *analysis* which is intended to determine why certain things happen and how one factor may influence another. Comprehension of this inter-relationship between two or more of the factors insofar as they may exist in the

urban environment is the most important consideration in the whole process of investigation.

Once the first two stages of investigation have been completed it will be possible to draw certain *conclusions*. If the survey has been properly carried out it will be possible to analyse the data and identify the problems and what solutions should be considered. The conclusions may in fact indicate a variety of possible solutions, superior or inferior, and by the same token offer reasonable answers to the building problem. This may include choices — no building, build some, renovate some, rent, lease, etc.

The last step is made when the planner applies his own discretion and adopts a strategy which — in his opinion — would result in the *best possible* recommendation. It should be noted that the final recommendations should:

- offer one solution only with firm advice and justification for urging its adoption and implementation;
- be strictly limited to practical and feasible actions which, in the circumstances, are likely to receive final approval;
- contain an approximate assessment and breakdown of the costs involved together with the scheduling, i.e., the phasing of the construction program;
- be feasible from the "land \$ development" point of view;
- be coordinated with ideas of the urban design architect;
- be in concert with DPW and client department policy.

Practical Interpretations

The recommendations should offer the *best possible* solution that will satisfy the realistic appraisal essential to final approval by the authorities concerned.

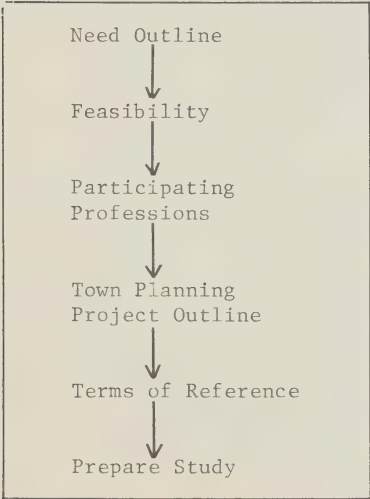
Planning reports — large or small — should be compiled in such a way as to clearly demonstrate the stages of survey-analysis-conclusions and in that sequence.

Final recommendation should include alternative solutions — those should be contained in the conclusions — but must offer a solution which not only appears to confirm optimum results but is likely to be implemented.

16 **REQUIREMENTS**

Town planning requirements must be identified prior to the commencement of the actual study. Depending on the size and importance of the federal project, the details of planning requirements could range from a brief assessment of a selected or proposed location to a comprehensive study possibly including long-range projections and an extensive analysis of cost estimates.

The town planning profession is not an exclusive one limited to a select few. Planners do indeed come from many different professional backgrounds. The practising planner must, however, have the capacity to adopt a comprehensive approach in evaluating a problem. Many of the federal projects, of course, have no need of a specialist's analysis and where an obvious influence on the urban development is foreseen this could probably be dealt with by an architect, engineer, realtor or economist. Many of the DPW administrators are capable of handling day-to-day urban development problems successfully. This book should therefore be of additional assistance as a source of reference in these matters.



2 Study Work Flow

The need for professional town planning expertise may vary from project to project. Once a town planner is involved in analyzing a particular question, the extent of his investigations — that is to say, his “terms of reference” — should be clearly identified.

DPW planners are conversant with the various services available from other government branches. The planning reports and assessments may, therefore conclude with recommendations against adopting certain solutions considered to be harmful in their immediate or ultimate effects on the urban area that is under discussion. This procedure is intended to assist other decision-making participants in avoiding a solution that is in contradiction to the principle of good planning.

The report must specify reasonable solutions. Possible alternatives, if any, must also be listed. The final decision will be made when the town planning report, together with other professional viewpoints — architecture, engineering, realty management, economics, etc. — is submitted to the decision-making authorities.

Major town planning studies and investigations — often carried out by private consultants commissioned from the private sector — should be based on clear and specific *terms of reference*. This document must define every detail of the planning investigation to be dealt with by the planner. Requirements set out in terms of reference often form the basis for legal agreements, fee schedules, times, allocations, etc.

Terms of references should therefore always be prepared by a professional planner so as to ensure that the proper use of planning terminology, and completeness of the essential requirements and priorities, are firmly established. When major planning investigations are organized, particularly those that necessitate the preparation of terms of reference, a *Project Outline* should be prepared by the federal authority responsible for the project. The project outline must define the problem and set out the overall framework for the town planning investigation:

Program — Type and nature of the planning study required.

Project — Title and identification of the federal project.

Objective — A description of what is to be studied and why.

Background — Major characteristics, criteria, identifiable constraints and inherent limitations.

Scope — Outline of work and area, time and cost limitations.

Project Cost — Budget allocations.

Files — Official references.

The project outline does not always require direct participation of the planner. However, when it is prepared by the authorities who have initiated the project, comprehension of the planning process involved would certainly be necessary.

Based on the project outline, the town planner will then prepare the terms of reference.

Although there may be considerable variation in the length and number of details, according to the nature of the project, certain characteristics are common to all correctly prepared Terms of Reference. These should include the following items:

Preface — A general introduction, setting out the scope and objectives of the study.

Site Data — A description of the limits of the study and planning areas, including aerial maps and photography.

General Description — The criteria for the preparation of the study which, besides describing the study and aspect of planning, must include the major characteristics of present development in the study area.

Terms — Sufficient detail to ensure an accurate appreciation of the:

- requirements that are to be studied;
- surveys and analyses to be completed in support of answers obtained from questions encountered in the process of investigation;
- consultant's responsibilities, and what, precisely, is he required to do;
- the kinds of data, information, cooperation, support, etc., the receiving authority should provide to the consultant;
- the direction and controls implicit in the study, its presentation and coordination;
- miscellaneous criteria of special items such as ownership, confidentiality, copyright, etc.

Costs — Details of payments, calculations, approvals for investment and securities required, if any.

Time — Scheduling and completion dates.

Methodology — This may be offered only if the authority requesting the study chooses to prescribe a particular approach or theory in completing the study.

It should be emphasized that the foregoing outline of terms of reference may only be required for comprehensive studies. Smaller planning assessments are undertaken on the basis of a request where only the purpose of the study and the question to be answered are prescribed. In the latter case, the planner is on his own recognizance to decide the length and details of his investigation.

Practical Interpretations

Decide whether or not a project requires input from a professional planner (See *Involvement Criteria*, under *Administration*, in this Chapter).

Prepare the project outline so as to identify specific needs.

Consult DPW-HQ Town Planning Section to see whether or not the job could be handled "in-house".

Ask for the preparation of terms of reference from HQ Town Planning Section when a comprehensive study is required.

Ascertain that funds are available to meet realistic cost estimates.

Ensure that the planning studies received will be referred to clients and participants for comments.

Ensure that planning studies will be submitted to the approving authorities to facilitate proper evaluation of the planning and environment control aspects.

CONSULTANTS

Town planning consultants, apart from routine day-to-day business, are often contracted to provide highly specialised consultant services. However, these services are only called for if:

- a comprehensive study is required;
- the HQ Town Planning Section does not have the immediate capacity to complete the study in time and/or if a particular field of work or specialty is outside the normal scope of its functions and responsibilities.

The reliability of the consultant and his experience in the particular specialty called for in the study should be carefully examined together with the quality of his ideas and what it contributes to the success of the project. DPW records on consultants' activities provide a reliable means of assessing the over-all capabilities of various consulting firms. Moreover, HQ Town Planning should be involved in the selection of a suitable consultant.

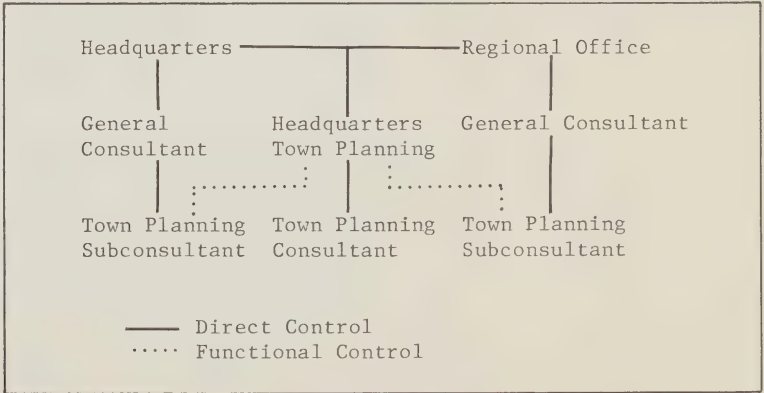
Consulting firms commissioned for work in DPW town planning work should have:

- at least one of the principals or associates of the firm with a full membership in the Town Planning Institute of Canada;
- reasonable experience and good records of performance in the designated specialty;
- capacity to complete the study in accordance with a specified date;
- preferably, an authorized resident representative (or regional office) in the area where the study is to be carried out.

Town planning consultants are engaged directly or indirectly. "Direct engagement" means that when the town planning consultant is commissioned by DPW to carry out an investigation as specified in the terms of reference he has thus entered into a contractual agreement with DPW to complete a designated investigation.

"Indirect involvement" means that DPW may request the principal consultant of a certain project to engage the (sub-contracted) services of a town planning consultant to investigate certain aspects of the development. In such a case, the town planning consultant enters into a contractual agreement with the prime consultant.

The town planning sub-consultant is expected to maintain direct and continuous liaison not only with his prime consultant, but with the DPW officer responsible for town planning in the department.



In both cases, however, the town planning consultant is required to follow technical direction received from the DPW officer responsible for town planning in the department. The completed studies should be submitted to the DPW officer responsible for town planning matters so that he may add his comments, assessment and recommendations affecting the acceptance or rejection of the study in part or in its entirety.

Practical Interpretations

- Ensure that all competent local consultants are actually listed in HQ files on consultants and that this information is kept up-to-date.
- Engage the HQ Town Planning Section if the commissioning of an outside firm's planning consulting work is called for.
- Engage private consultants only if the HQ Town Planning Section cannot provide the necessary service(s).
- Ensure that all planning reports submitted for executive approval include all the comments and evaluation recorded by the HQ Town Planning Section.

ADMINISTRATION

- Project administration rests with the designated project manager in the Department of Public Works. Control, direction and approval of the town planning consultant's work also come, directly or indirectly, under the administration of the Department of Public Works.
- This also means that all federal, provincial or municipal coordination of work is carried out in the name of the federal Department of Public Works and consultants are regarded as additional DPW staff in the capacity of professional advisers (specialists) for the duration of specific projects.
- Town planning consultants are commissioned on a contractual basis. The contract should specify the authorized contact(s) in the Department of Public Works.
- Insofar as the work of private-planning consultants is concerned project managers are only responsible for its coordination. Technical direction, costs control, receipt of the study, etc., are handled by HQ Town Planning Section. When a project comes under regional authority HQ Town Planning Section exercises the same controls over the consulting service contracted to the Regional Director.
- The town planning discipline is applied in federal projects, design, construction and administration whenever this specific service is required in the opinion of those responsible for the project.
- Town planning assessment is usually required if any of the *involvement criteria* listed below would apply to a given federal project. The analysis and evaluation of various locations or sites are necessary when:
 - an urban area is assigned for a DPW project involving a land market value in excess of \$1/4 million, construction of \$1 million; or in excess of 20,000 sq. ft. of net floor area;
 - coordinating DPW policy with private development projects if it includes or affects federal development or real estate in excess of a combined land and construction value of \$1¼ million;

- dealing with municipal zoning and development control requirements if changes are needed (meaning a relaxation of the requirements), applications and presentation are made to obtain such and/or when a conflict of interest develops regarding these matters;
- presentations are made to local authorities for information or concurrence if such DPW project's combined land and construction cost exceed \$1¼ million; lion;
- "in house" design teams are formed where the combined land and construction costs exceed \$1¼ million;
- outside town planning consultants are commissioned to study and advise regarding planning and environmental requirements. This includes the selection, preparation of terms of reference, technical direction, acceptance of the study and financial control and when;
- dealing with comprehensive urban development projects exceeding a combined land and building value of \$1¼ million.

Practical Interpretations

- Secure the town planning input of federal projects if any of the involvement criteria apply.
- Ensure that the necessary funds are available to cover costs of planning consulting services.
- Initiate action for town planning consulting with regard to federal projects where special circumstances — not listed in the criteria — would necessitate such involvement.

PROJECTS

There are various types of projects that require town planning consulting services. Some of the projects may be in the pre-design stage where the town planning input is intended to help the decision-making authority in considering the approval of the project. Others may have received formal approval and the town planning study is required to assist in the design or site selection. In either case it is a function of DPW project management to call for the type and extent of the town planning service required.

Projects that require town planning input might be in one of the following four administrative categories.

Headquarters Projects — These are usually projects in the active stage of preliminary development, and not necessarily for approval except by way of evaluation for possible future action.

Also in this same category are large-scale projects that are considered to be important or of a specialized nature. In such instances, HQ management retains control of the full program.

Joint Projects — These are projects — already approved — whereby DPW management decides that joint control is required and designates project management from both Headquarters and the Region. Large-scale projects for which local investigations, contacts and large-scale coordination with local authorities or continuous input from the Region are required, also belong to this category.

In such cases the Regional Director designates a member of his staff to co-operate closely in administering the town planning consultant's work. Technical direction, however, should still be obtained from the HQ town planning specialist. Assessment of the planning proposal, adoption of its recommendations and approval procedures will be carried out jointly by Headquarters and the relevant local DPW office.

Regional Projects — Projects assigned to Regional offices are usually approved at the design or implementation phase.

Administration of such projects is under the authority of the DPW Regional Director. Technical direction of the town planning consultant, however, should still be

forthcoming from the Headquarters' officer responsible for town planning. The latter's assessment of the completed report and recommendations for approval should supplement the consultant's study and is considered by the Regional Director together with the consultant's report.

Client Projects — Where federal departments and other clients agencies request the town planning consulting service a study is made by HQ Town Planning Section with or without the services of private consultants.

Administrative controls are exercised by the client department, technical direction rests with the DPW officer responsible for town planning.

The report is presented to the client by the HQ Town Planning Section.

Regarding the nature and type of projects, the following five categories should be noted.

Physical Development — When the town planning consultant is asked to investigate the physical characteristics of a particular location e.g., the siting and grouping of buildings, special relationship, functional requirements and environmental relationship, aesthetical functions, the urban structure points of view, etc.

Social Implications — Where the impact of the proposed development on the social structure or functions of the community is studied against existing standards or desired objectives.

Economic Investigations — Land use development capacity, market potential, cost/benefit studies, etc.

Comprehensive Studies — Where all the above aspects are investigated with a long-range view as to the impact of a particular development on the surrounding environment. Such studies would include analysis and recommendations relevant to land uses, utilities servicing and general transportation aspects as well.

Site Selection Studies — By means of which a number of possible sites for a particular development are compared and contrasted as that the most suitable one can be selected and recommended for approval.

DPW building projects might require town planning studies because:

- the importance of the structure could, feasibly merit further investigation regarding government presence, quality, appearance, functional aspects, etc;
- the volume of the development and service (transportation, real estate value, etc.) and/or of problems generated by it;
- the influence of the building and its impact on the surrounding environment insofar as they may alter the perimeters of future development or generate new focal activities, etc.

The type and character of planning investigations are clearly identified in the terms of reference prepared separately for each project. (See under *Requirements* in this Chapter).

For easy reference a summary of the foregoing is shown in the following table.

Table 1 — DPW Projects

Authority	Stage	Size	Nature of Study
HQ	pre design or approved	variable (usually large)	Variable: physical
Joint-HQ & Region	approved or implementation	large	development, social
Regional	Approved or implementation	average	implication, economic investment,
O.G.D. (client)	pre design or approved	variable (usually large)	comprehensive site selection etc.

Source: HQ Town Planning Section, 1972

Practical Interpretations

Identify the category that is applicable to the particular project and establish project controls accordingly.

Define clearly the objectives of the town planning investigation and specify the type of town planning input required.

Check the project in your area to ascertain whether the importance, volume, influence etc., necessitate any town planning assessment.

BRIEFING

The town planning consultant should be carefully briefed by the DPW officer responsible for the project regarding the general and specific requirements of his study.

If the planning input is provided by the *HQ Town Planning Section* the briefing should be a continuous sharing of information and ongoing liaison with the project management and local authorities as well. The success of the town planning assessment largely depends on up-to-date knowledge of policy changes and new decisions.

If the town planning consultant is engaged as a *subconsultant* to the prime consultant, he should participate at the Design Briefing Meeting.

The DPW Project Manager supplies the prime consultant with sufficient copies of the project brief to acquaint the town planning subconsultant with all details of the main project.

The town planning consultant should familiarize himself with all the requirements and obtain classification of any details about which he may have doubts during the Design Briefing Meeting. If the Design Briefing Meeting does not include the DPW officer responsible for town planning, the town planning subconsultant should establish and maintain direct contact with him as soon as possible because he is to exercise technical direction of the study.

If the town planning consultant is commissioned directly to carry out the study, the Design Briefing Meeting should be called by the DPW officer responsible for town planning and he should include all interested parties at his own discretion.

The town planning consultant should maintain a direct and continuous liaison with the DPW officer responsible for town planning.

Prior to the commencement of the study, the design briefing should always include a *site visit* together with DPW representatives and preferably, precede the Design Briefing Meeting.

Practical Interpretations

Call the Design Briefing Meeting with all the interested parties present.

Make all the relevant material and information available to the town planner.

Organize a site visit prior to the commencement of work.

EXPENDITURES

This section is intended to provide general information concerning various types of payment pertinent to town planning studies.

If the *HQ Town Planning Section* completes a study and the federal government adopts the policy of full cost recoveries and revenue dependency for DPW operations, the Town Planning Section will charge payroll x 2.25 for their services.

This policy has not so far been adopted, consequently the DPW budget provides for all expenses from HQ allocations.

If a *private consultant* is engaged the following shall apply.

For the preparation of the study, the total costs shall include all expenses which might be incurred in connection with the completion of the study.

Depending on the nature of the study, the town planning consultant may be reimbursed in accordance with the following conditions.

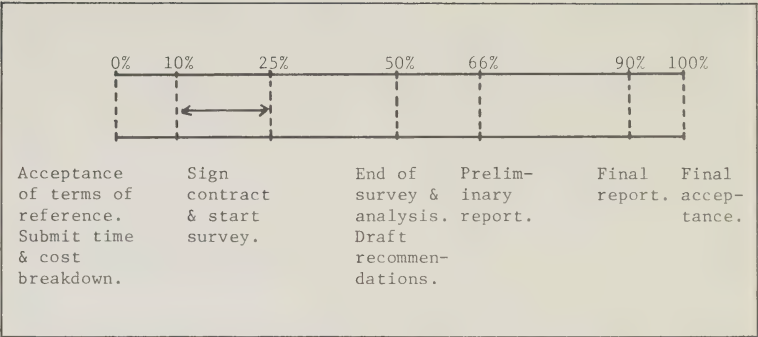
A *lump sum payment* may be made for the completion of his investigation and presentation of his report in complete fulfillment of the requirements as specified in the terms of reference and agreed upon in the contract documents.

In case of lump sum payment the town planning consultant is not requested to provide details of his expenses or expenditures and, unless additional requirements are introduced by the Department of Public Works, he is obliged to complete the study in full detail for the lump sum payment originally agreed upon.

Per diem rates might be applied when principal, professional, technical and clerical workdays spent in the completion of the study are listed by the town planning consultant and paid for in accordance with prevailing professional fees applicable in the area.

All additional expenses incurred should be listed separately by the town planning consultant for payment.

When per diem rates are applied, the contract shall include a clause specifying the maximum amount which might be paid for all fees, expenses, costs, etc., together. The terms of reference should include the time and expense allocation where a breakdown of expenditures should be provided by the town planning consultant.



4 Progress Payments

Progress payments are made in accordance with DPW regulations on a percentage completion basis. Without going into any unnecessary details, it should also be mentioned that various other methods may be applied for reimbursements, item by item, payroll times factor, actual costs plus profit, etc.

Agreements drafted for town planning consulting work should always specify the acceptable maximum costs of the planning exercise.

In accordance with DPW regulations part of the contract costs may be paid when contracts are signed with progress payments following on the percentage completion basis.

The last 10 percent shall not be invoiced prior to the final acceptance of the study by the HQ Town Planning Section.

Practical Interpretations

If private planning consultants are engaged ensure that the necessary funds are available.

Agree with the consultant regarding methods of payment.

Verify rates with the local group of the Town Planning Institute of Canada.

Identify the person who is responsible for cost controls. If this person is other than the DPW officer responsible for town planning (or his authorised representative) no invoices should be accepted without the prior approval of the designated DPW officer responsible for town planning.

Submissions and presentation of the study must be in accordance with all the details specified in the terms of reference.

Studies should include such charts, tables and drawings as are necessary to illustrate the background information used by the town planning consultant to formulate his proposals. These should be supplemented with plates, tables, and figures prepared by the town planning consultant to support his conclusions and recommendations.

The presentation should use techniques and symbols generally accepted in the town planning profession.

Models are required only if so specified in the terms of reference.

The town planning consultant needs not necessarily include all the supporting data and background information used in

preparing the study. He should, however, retain such data in his ownership and possession including surveys and analyses and shall at all reasonable times permit DPW to peruse and reproduce such data.

Proposals should always be accompanied by a preliminary cost estimate (including phasing program) and length of time required for implementation to enable the approving authorities to consider the proposals realistically.

A *Preliminary Report* should be presented to provide an outline of the final recommendations. Comments or criticism of this report by DPW officials should be interpreted by the town planning consultant as instructions for necessary alterations. DPW comments, however, will be chiefly concerned with government policy and shall in no way restrict the town planning consultant in the presentation of his own ideas or the free assessment of his investigations.

The successful presentation of the Preliminary Report would usually be considered as a 66 percent completion of the whole task.

Unless otherwise stated in the terms of reference, the town planning consultant shall supply DPW with five copies of the Preliminary Report and 25 copies of the final presentation.

The town planning consultant must treat and handle all information received from various government agencies during the preparation of the study, surveys and analyses, etc., as *confidential* and shall not release or make such information available to anybody without the written authorisation of DPW.

If the town planning assessment is completed by DPW town planners, the necessary documentation requirements should be established by the DPW officer responsible for town planning.

Practical Interpretations

Specification of all essential documentation should be agreed upon prior to the commencement of the study.

A "Preliminary Report" is always necessary if a private consultant is engaged.

The confidentiality of the data handled by the private consultant must be adequately protected at all times.

2. Coordination

GOVERNMENT AGENCIES

The control of building activities and the enforcement of development plans are administered directly or indirectly by a number of agencies at all three levels of government.

DPW acts on behalf of the federal Government and, as such, may not be restrained in their actions. The coordination with other agencies nevertheless forms an important part of a task aimed at more effective and complementary development.

The following *federal agencies* are involved in the town planning process.

Ministry of State for Urban Affairs (MSUA)

The function of this recently organized federal department is to coordinate:

- the activities of various federal agencies;
- federal activities with provincial and municipal bodies;
- with private planning programs and consider private comments and reactions to federal planning actions;
- or conduct research regarding the needs of an improved urban milieu.

Department of Regional Economic Expansion (DREE)

This department participates in town planning projects by direct management or financial undertaking aimed at overcoming regional disparities.

Planners of DREE consider town planning programs in terms of an overall regional concept and with a specific interest in making special provisions for handicapped areas.

National Capital Commission (NCC)

The NCC is authorized by a charter of the legislative authority to control federal development of the National Capital Region "in order that the nature and character of the seat of the Government of Canada may be in accordance with its national significance."

Department of National Defence (DND)

This department provides for its own needs as required. DND planners are to be consulted in all cases when the proposed planning program effects DND activities.

Ministry of Transport (MOT)

MOT provides for its own needs as required. With regard to comprehensive planning programs, such as development of large airports, the planning process includes the provision of a large variety of related functions which are intended to serve the needs of the general public as well.

Department of Indian and Northern Affairs (DINA)

DINA carries out planning programs for: national parks; Indians; and northern areas.

As a supplementary to the above three main responsibility areas, a recently organized division is responsible for the planning of community improvements in areas under the authority of the department.

Central Mortgage and Housing Corporation (CMHC)

CMHC is a federal Crown Corporation in charge of funds appropriated by the National Housing Act. The corporation deals with residential accommodation only nevertheless, other federal government activities are quite often influenced by their actions.

Canadian National Railways (CNR)

As a federal Crown Corporation, the CNR plans for its own needs and should be involved whenever federal projects are associated with the use and development of corporation's properties.

Department of Public Works (DPW)

DPW is an implementing agency for federal construction, realty management and accommodation.

Canadian Council on Urban and Regional Research (CCURR)

CCURR distributes funds for related research and administers completed studies.

The Federal Treasury Board, Privy Council Office and the Prime Minister's Office all have planners to assist in decisions made with regard to various federal programs.

It should also be noted that the Department of the Environment has an Urbanization Section in which planning projects are coordinated with environmental stan-

dards. The Department of National Health & Welfare deals directly with problems in social planning. Both departments are actively concerned with the comprehensive planning approach.

Provincial Agencies

These vary, depending on the province; however, typical examples are listed below.

A Provincial Planning Board enforces the Provincial Planning Act.

A Department of Municipal Affairs usually controls legislation and has a group of planners in charge of various planning studies.

Regional Planning Authorities exercise planning controls and prepare plans for large areas (may include several municipalities).

Provincial Housing Authorities — are in charge of provincial housing and residential projects.

Provincial Crown Corporations implement joint federal-provincial projects or deal with a specific large scale project.

Municipal Agencies

These have authority to plan and control development within the limits of a metro area or individual municipalities and maintain their own departments or commissions for this purpose.

Municipal (metro) planning departments — are concerned with zoning enforcement, subdivision and building controls, etc.

Various municipal commissions are appointed for land use, transportation, school planning, etc.

All the above agencies, representing one or other of the three levels of government, may be contacted for coordination with federal projects.

Practical Interpretations

Analyse the federal project to determine its possible impact on programs already drafted by other agencies.

Discuss with the agency concerned the possible influences that may be exerted by the federal project and the effects of other plans, if any, will have on the federal project.

Try to eliminate possible conflicts and add to the project new elements that are beneficial to other plans.

PERMITS

As a voluntarily accepted requirement the federal government obtains permits for use and construction issued by other levels of government.

It is not a town planner's responsibility to procure permits. However, planners are expected to provide advice regarding any requirements — as stated by the local authorities — which may be in conflict with the federal project. The planner is involved in negotiations to identify requirements and usually arranges for changes, exemptions or relaxations as necessary.

There could be a large variety of permits depending on the size of the project, location, nature of activities, etc. Some of the most typical permits usually required if building in an urban area are listed below.

Certificate of Zoning Compliance — A certificate which states that the proposed location is acceptable and there is no conflict to accommodate the proposed uses and activities within the provisions of the existing zoning by-law.

Building Permit — This states that structural and construction details, design provisions and the general appearance of the proposed structure, are acceptable. These data must also include precise information about height and bulk requirements, density (FSI) considerations, parking and access provision, etc.

Demolition Permit — This confirms that the removal of some existing structures is agreeable to the local authority.

Occupancy Permit — This states that the structure is ready for use and is in accordance with safety regulations.

Practical Interpretations

The necessary permits must be obtained by the local DPW office.

Town planning assistance is needed to identify requirements and, if applicable, to negotiate necessary relaxations and exemptions.

Prior knowledge of special requirements could save time and money in design and construction.

DESIGN ACCEPTANCE

Professional town planning participation in the design exercise is usually not necessary.

Following the pre-design exercises, decisions regarding location, size, functions and general appearances are already available. The architectural and engineering designers may ask for some guidance regarding the external approaches, e.g., entrances and exits, internal circulation, land utilization, coordination with nearby projects, inter-relationship between units, etc. The extent of town planning involvement during this stage is at the discretion of the Project Manager.

The final process for design acceptance should include town planning assessment. Major projects will call for town planning representation when the Design Committee meets. Minor projects may or may not necessitate a town planning assessment of the design during the approval process.

The importance of the above is quite obvious when considering special arrangements and functional coordination in terms of the general environment and within the site area itself.

Practical Interpretations

In the case of any major project, the Project Manager is responsible for continuous planning participation in its design (See *Administration*, in the preceding Chapter).

Minor projects may or may not necessitate town planning participation.

Ultimate acceptance of a project includes town planning assessment of design elements and overall concept.

If the design is not acceptable from the town planning point of view, the functional head responsible for design should make a final ruling.

APPRAISAL

Projects are to be assessed a few years after completion in order to check on functioning and the location.

The appraisal is completed by a team of professionals representing various disciplines at authorized levels of professional competence. Projects that require town planning participation in design, construction and administration, (see *Involvement Criteria*, under *Administration*, in the preceding Chapter) should be assessed by a team, including a town planner as well. Where the extent or importance of the town planning content does not warrant such specialist participation the town planning aspects will form part of the architectural portion of the appraisal.

The town planning appraisal must include a comprehensive investigation of location and functional compatibility regarding land use, utilities servicing and transportation aspects.

Project appraisal should include a site visit where the actual functioning and appearance of the project should be investigated.

The comments of the client department and individual users selected at random should help the town planner in arriving at his verdict.

Local reactions of the news media, municipal representatives and private citizens should also form part of the assessment report.

Practical Interpretations

After the usual one-year guarantee period has expired and prior to the commencement of the third year, an appraisal of the project's functioning should be made to determine the extent to which the project has been successful.

The team of appraisers should enlist the services of a town planning professional for each major project.

A site visit should be included as a part of the assessment.

Clients, users, general public, local news media and municipal authorities must be contacted for comments and opinions.

Identify Project

Name Manager

Form Professional Team

Arrange for Site Visit

Check with Client Dept.

Obtain Users Comments

Obtain Original Plans,
Contracts, Project Brief,
Cost Estimate, etc.

Obtain Actual Plans &
Figures of Implementation

Visit Site

Obtain Local Comments
or Criticism

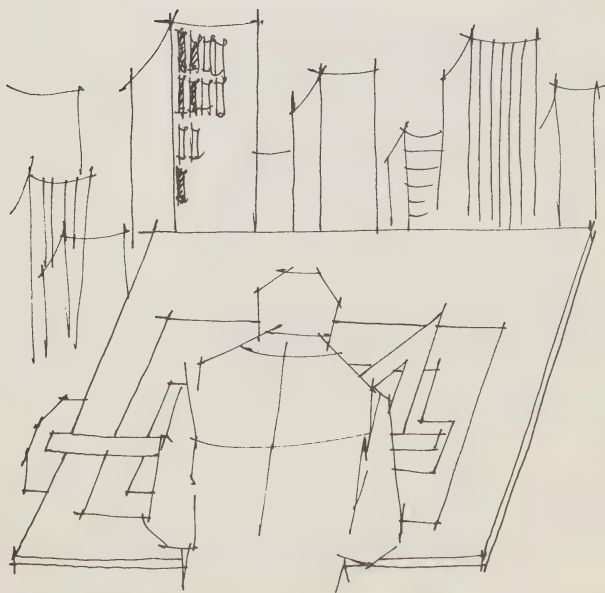
Appraise Appearance,
Functions, Structures,
Maintenance, Efficiency, etc.

Prepare Comprehensive
Report of Appraisal

5 Appraisal Work Flow

Part II

Technical Considerations



3. Land Use

28 CATEGORIES

Land use may be defined in many ways. However, the simplest definition appears to be "the ways and means to utilize land surface areas."

Due to variations in land use a system of classifying, coordinating and recording land and space use is essential. The classification should group similar categories of land use for some predetermined objectives. It should allow analysts, city officials, realtors and planners to work with "families" of land use in various kinds of analyses. Functional land use characteristics, such as residential or commercial, where the activities carried out by people in the particular location would determine the use classification, should not be confused with parcel characteristics, such as location (central, peripheral), size, topography, etc. or with structure characteristics, such as type of building, material used, condition, etc. Each land use category

should describe the dominant use or function that the land is put to serve together with a list of ancillary uses where necessary.

The principal land use categories may be listed — according to the functions they serve — as follows:

Undeveloped: natural wilderness
conservation (watershed)
rural — agricultural.

Developed: residential
commercial
industrial
public — institutional.
parks — recreational.

The planners job is to provide for each of these uses in a healthy balance and with appropriate relationship between individual categories. The tool used to arrive at the desirable proportions (balance) between various functional land uses is "zoning" which will be further discussed under *Zoning* in Chap. 5.

Land use should not be confused with zoning, the former being the principal objective — planned to develop a certain concept — whereas the latter provides for the controls necessary (or tools applied) to arrive at the preplanned concept.

A federal development project should be located in accordance with overall functional land use concepts adopted by the municipality. If the "highest and best" use, securing the greatest net returns for the investment (see *Site Potential*, in Chap.4) appears to be in conflict with the pattern of functional land uses adopted by the community, the federal use selected should rather be reconsidered and coordinated with functional land use requirements.

Practical Interpretations

Learn from the municipal planning office the proper meaning of their land use classifications.

Identify the land use category into which your particular project falls in accordance with functions (activities) generated by it.

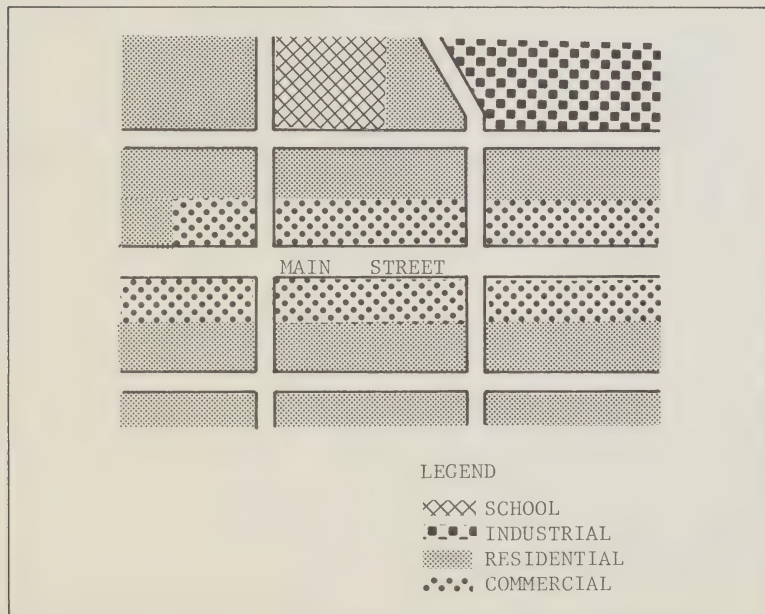
Study the overall land use concept for the municipality, including past trends and future projections.

Select a location compatible with the functional requirements of the federal program.

Do not select any location without some consultation with local planning officials.

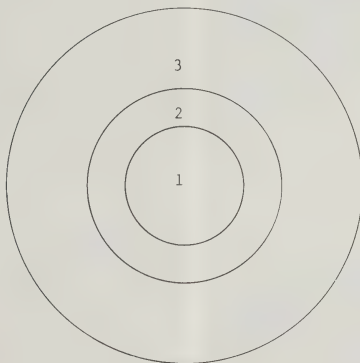
In case of mixed uses all functions of the federal project should be fitting to the overall land use concept.

To avoid conflicts in the future land use pattern, take into consideration uses which may be generated in the future by the federal program.



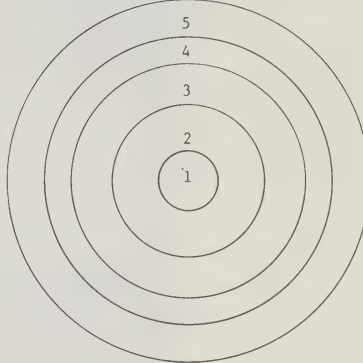
CONCENTRIC AREA

- 1 Developed City
- 2 Agricultural Support
- 3 Regional Belt



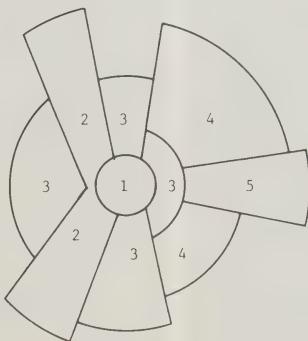
CONCENTRIC CITY

- 1 Central Business District
- 2 Zone of Transition
- 3 Suburbia
- 4 Estate Residential
- 5 Regional Commuters



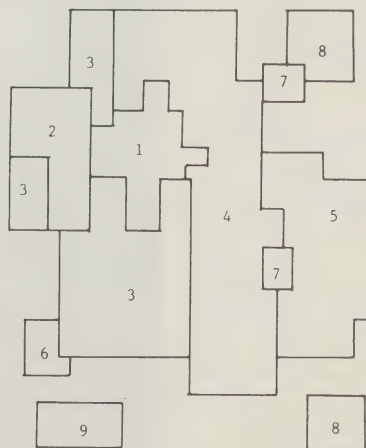
SECTOR CONCEPT

- 1 Central Business District
- 2 Wholesale & Light Industrial
- 3 Low-Class Residential
- 4 Medium-Class Residential
- 5 High-Class Residential



MULTIPLE NUCLEI CONCEPT

- 6 Heavy Industrial
- 7 Outer Business District
- 8 Residential Suburb
- 9 Industrial Suburb



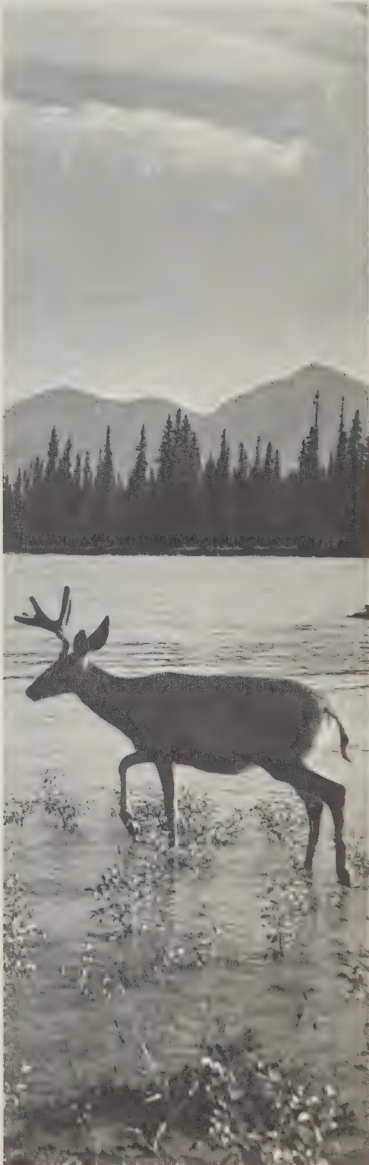
Source: DPW, HQ Town Planning

30 **UNDEVELOPED**

Land in this category could be in *three major groups*: natural (wilderness), conservation (watershed), rural — agricultural.



8 Natural Wilderness



9 Conservation Area

These are the kinds of land uses that are intended to preserve open space in its natural (original) state i.e., to keep it from being used for buildings or structures. The land may be utilized with a minimum of man-made structures for the production of agricultural goods. The main function of the open space is to protect the physical resource bases — air, soil, water and plants. Proper protection and preservation of physical resources will, for example, reduce flood damage, protect water supplies, clean the air, nourish the soil, sustain wildlife, assist lumbering and farming, and provide scenic amenities for people. Due to the complexity and interrelationships of the element involved in rural-conservation areas, preparation of an inventory and analysis of the resources often requires the combined services of experts in the fields of soil science, hydrology, geology, ecology, biology, forestry, geography and agronomy.

Public agencies may acquire the land for rural-conservation areas by expropriation, purchase or donation. Partial rights to the land could also be obtained through easements. Easements may give certain positive rights to the public by allowing them the use of the land for hiking, fishing, riding, hunting etc. Easements may also be negative by prohibiting any public or private use of the land, thereby restricting the owner's activities on the land. Examples of this are conservation easements which limit land uses to farming, forestry, wetlands or scenic easements along highways. Easements may be both negative and affirmative, as in the case of some watersheds where the owner's use is restricted and the public's use is increased. Easement agreements for trails can be applied to make sure that the scenic value of the trails will not be destroyed by improper use of land bordering the trail. The use of easements keeps land productive and in the taxable category, but allows the public agency to have a cheap means of controlling the land use.

If a public agency owns the lands in this category it can, in some cases, put it to a productive use, such as farming. The agency still controls the use of the land through leasing agreements. However, the

use for which the land is leased should suit the overall open space plan for the area. For example, land used for certain types of agriculture will almost invariably maintain the groundwater supply and often continue to sustain favourable conditions for wildlife habitat. In this manner the land will also produce rent for the public agency.

Practical Interpretations

The above three land use categories are usually not to be selected for permanent federal projects unless the proposed federal use directly serves, controls or protects the principal land uses, e.g., water reservoirs, ranger stations, observation structures.

To prevent any misuse, the natural and conservation land use areas are best protected when they are owned by the public.

Rural-agricultural land is often assigned to future uses (e.g., future industrial usage) and could be selected for federal uses compatible with the future land use category. Such a selection should be made subject to the economical provision of appropriate service connections, e.g., road, sewer, water.

No federal land uses of any kind should be located in the above land use categories unless such nuisances as, for example, waste, emissions, noise, vibration, etc. are fully controlled.



This category encompasses all land which serves the purpose of permanent accommodation for the population. It is developed for various types of dwelling units. The densities per acre of dwelling units or persons are usually the criteria which determine the type of residential land use.

The three basic categories of residential land use are usually recognized as: low, medium, and high density uses, and these include various further breakdowns in each of the main groups. A more detailed discussion is offered under *Zoning* in Chapter 5. At this stage, however, it is only necessary to point out that low residential densities would not automatically command higher land values or represent a more sophisticated, high-quality type of land use. Notwithstanding general belief to the contrary, the medium-density residential areas, with a mixture of single and multiple dwellings do usually ensure a reasonable degree of residential and domestic privacy. Moreover, such areas may also contain a number of necessary urban facilities and conveniences that are, in fact, welcomed by the residents in general.

As a general rule, to classify each of the densities the following criteria should be applied as shown in Table 2.

A residential land use to accommodate house trailers may also be mentioned separately. The number of house trailers per acre may vary from 6 to 14 units.

Practical Interpretations

Residential land use is limited to the accommodation of dwellings and other specifically compatible functions.

Any public land use within a residential sector will have an influence on realty property values.

No federal function belongs appropriately to a residential land use sector.

Possible government uses which may be conditionally permissible in a residential land use sector include the following: fire station, police station, public utility installations, communication stations & equipment, parks, archery grounds, horticultural nurseries and greenhouses, parking areas, hospitals-sanatoria, health clinics, training schools-colleges, club houses & related land uses, sport fields (non commercial), nursing-convalescent homes and credit union offices.

Table 2 — Residential Densities

Density	Dwelling Type	Dwelling Units/acre
Low	Single	1-6
	Double	6-12
Medium	row, garden town, four-plexes, walk up etc.	10-20
High	apartments highrise	20-400

Source: HQ Town Planning Section, 1972



11 Residential Low Density



12 Residential Medium Density



13 Residential High Density

COMMERCIAL

This includes land uses associated with the retailing of goods and services, offices wholesaling and other related services. Commercial areas are classified according to their size, location and main functions.

Central Business District (CBD) — This is the downtown part of a city. It is usually characterized by high-rise buildings, the highest land values and concentration of business activities. Its main functions are directly related to the retailing of goods and services and the day-to-day activities of business offices. It contains the bulk of the city's retail and office buildings. Buildings associated with the CBD are: large office buildings, large department stores, banks, hotels, apparel shops, specialty shops, restaurants and theatres. Civic centres and cultural entertainment are usually located in or near the CBD. Wholesaling, warehouse and storage facilities that serve the CBD are generally located in or on the periphery of the CBD.

Regional Shopping Centre — A major facility and its total area including parking generally exceeds 20 acres. It serves a major portion of the city and/or a region. Its trade area contains 30,000 to 100,000 people. It has one or more major department stores that act as main attractors, together with numerous small stores and some comparatively limited office space. Such a shopping centre is generally situated on or closely adjacent to the intersection of major arterials or freeways in peripheral or semi-peripheral locations.

District Shopping Centre — A shopping facility that serves three or four neighbourhoods or 10,000 to 20,000 people. It is approximately 3 to 10 acres in size and contains a large supermarket as a major attractor. In addition it contains retail stores such as clothing stores, TV sales and beauty parlors, etc. They are generally located at the intersections of major arterial routes.

Neighbourhood Shopping Centre — This type of centre usually serves one neighbourhood or approximately 4,000 people and is about three acres in size. It contains a grocery store, a drug store and other small business establishments.



14 Central Business District



15 Regional Shopping Centre



16 Neighbourhood Shopping Centre

36 **Highway Commercial**

(HwyC) — This is commercial development that depends on vehicular access and is therefore located on the main highways that enter the city. The HwyC caters to the needs of the travelling public and offers facilities, such as motor hotels, motels, restaurants and service stations.

Local Commercial (LC) — is a spot land use usually situated at the corner of local street intersections. The services of LC are intended for local people only and are usually within short walking distance for most customers.

In addition to the above-mentioned typical commercial land uses, there is a variety of *combined uses* whereby the main floor or the frontage functions as a commercial sector, while the rest of the site and/or the upper floors accommodate residential dwellings or fulfill other functions. (see also *Mixed Uses*, in this Chapter).

In passing, it is convenient here to mention *home occupational uses* where a commercial activity is carried on in part of a dwelling as a supplement to its original designated use, e.g., barber, tailor, watchmaker, kindergarten, etc.

Practical Interpretations

General offices properly belong to the commercial use category.

Large concentration of a daytime population should, preferably, be situated in the CBD area.

Offices that have regular contact with the general public should be centrally located in the area they serve.

Low-density government offices (e.g. laboratory) should, preferably, be located in peripheral or semi-peripheral commercial areas.

Possible government uses which may be conditionally permissible in commercial areas include the following: Exhibition halls, information centres, health clinics, libraries, parks, parking areas and structures, post offices, catering establishments, training schools and colleges, hospitals and sanatoria, liquor stores, police stations, clubs and related facilities, public utility installations, communication stations, and facilities, printing bureaus, film studios, fire stations, hotels and hostels, workshops, warehousing and scientific laboratories.



17 Highway Commercial



18 Local Commercial

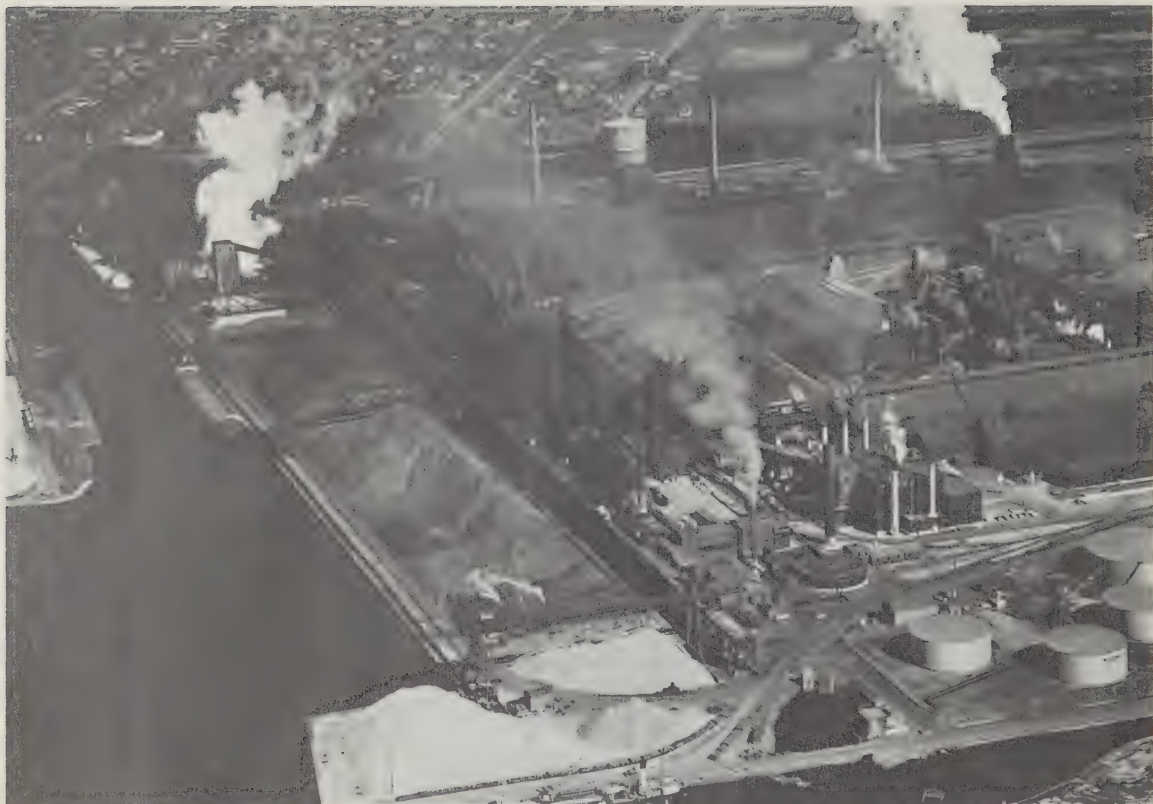
INDUSTRIAL

The main use of land in this category is devoted to the manufacture, storage and distribution of goods and services. Industrial areas are classified by the allowable or permissible functions that can take place there, consistent with industrial performance standards. Permissive zoning lists only those industries which are considered to be desirable for a particular zone, all others being excluded. Performance standards classify industries by their environmental impact. The environmental effects in planning standards are noise, vibration, air pollution, radioactive radiation, glare, humidity, heat, liquid and solid wastes, fire and explosion hazards.

Industrial areas are usually divided into three main categories: light industrial (ML), heavy industrial (MH), and special (restricted) industrial (MS). (see also *Zoning*, Chap. 5).

In the *light industrial* area performance standards are measured at a lot line. No industries that generate adverse environmental effects beyond the lot line are permitted in the ML area. Examples of industries generally found in light industrial areas and warehouses, freighting or transport terminals, pharmaceuticals, food products, plastics, ceramics, textiles, furniture or activities similar to those listed.





20 Heavy Industrial Area

For *heavy industrial areas* performance standards are usually measured at the boundary of the industrial district. Environmental effects from an industry cannot exceed the set standards and should have no adverse effect on the land surrounding the MH area. Examples of industries that meet these criteria are equipment assembly plants, machine shops and bulk oil storages.

Special (Restricted) industrial areas contain industries that emit offensive by-products such as noise, smoke, odours or various other forms of pollution. These MS areas are usually located on the peripheries and downwind from the city so as to minimize the negative effects of the industries. Compatible transitional land uses are generally used to achieve a physical separation between this area and the more populated parts of the city. Examples are: railway shops and marshalling yards, salvage or scrap yards, oil refineries, plants devoted to the manufacture of chemicals or cement products and installations for generation of electricity.

Another widely used breakdown of industrial uses would include primary, secondary and service industrial activities.

Primary industry produces from bulk natural resources, such as steel, paper, lumber mills, oil refineries, cement factories.

Secondary industry is primarily related to the manufacture and assembly of a great variety of products, machinery, fixtures and appliances, e.g., sheet metal products, electrical and other appliances, and products of machine shops.

Service industry is concerned with employment; in effect, it is a facility essential to the supply and sale of goods and services. These services are rendered to the general public and include entertainment facilities, and employment in a wide variety of service occupations in professional offices.

In a modern industrial country the proportionate distribution between the above three categories could be, on the average: primary industry, 8 percent; secondary industry, 42 percent; service industry, 50 percent.

Practical Interpretations

Government agencies that have direct contact or a service relationship with the public or are in the general office category should not be located in industrial areas.

The post office bulk mail handling and distributing function is best situated well inside industrial areas.

The costs and availability (capacity) of services in industrial locations must be thoroughly investigated in accordance with actual needs.

Rail, road, air, water, etc. and access routes to industrial locations are of primary importance.

Permissible (conditional) government uses which may be located in industrial areas include: parks, storages, warehousing, ferry terminals, assembly plants, printing and lithographing plants, hatcheries, laboratories which generate offensive by-products, parking areas and structures, open-air storages, communications equipment and transmitting stations, public utility installations, film and testing laboratories, fire stations, liquor stores, libraries that are not open to minors, machine shops, workshops, police stations, public utility installations, energy-producing plants, installations and transformers, grain elevators, explosives manufacture or storages.

Public and institutional land uses provide for the functioning of various levels of government and the provision of essential public services. The land uses can be further classified as follows:

Government Buildings

These are buildings that are used specifically for carrying out the administrative and research work of the various levels of government. Included in this category are: municipal buildings (city halls, welfare offices, etc.); provincial buildings (parliament buildings, courthouses, office buildings, etc.) and federal buildings (research centres, post offices, office buildings, etc.).

Cultural Facilities

These are land uses that serve the cultural needs of the people. Large populations are generally required to support these facilities. Examples of cultural facilities found in larger urban centres are libraries, auditorium, museum, art gallery, planetarium and civic centres.

Sport Arenas

These are sport complexes. Developed with the spectator in mind, they usually have a large seating capacity and are located close to public transportation or arterial roads.

Examples of these facilities are arenas, football and baseball stadiums, race tracks and fairgrounds.



21 Government Buildings



22 Cultural Facilities



23 Medical Facilities

Public Service Facilities

Fire stations are located in strategic positions throughout urban areas. The actual number of stations will depend on the property values. Generally speaking, one station will serve an area of about one mile radius.

Police stations are also located throughout cities. However, they are not as densely concentrated as fire stations.

Medical Facilities

Hospitals, health clinics and nursing homes are located on a regional basis throughout urban areas. The size of the facilities and their number is proportional to the population they must serve.

Churches

Places of worship established by religious denominations. Locations of churches vary from the central area to the suburbs.

Practical Interpretations

If areas are allocated for public institutional (government) uses, federal activities may be present or developed in such areas.

Federal activities cannot share in the use of sites with other public activities unless the functions of both are very similar to one another and there is a clear identification of the federal presence.

The general nature of public institutional land use category will necessitate an open park-like setting for buildings.

Public institutional land use does not permit any commercial activity not even as a joint use concept.

Permissible (conditional) federal uses which may be located in public institutional areas include (supplement to any of the above listed uses): penal institutions, diplomatic premises, public utility installations, charitable institutions, parks, military bases and installations, communication stations and installations.



24 Church

42 **PARKS — RECREATIONAL**

Land in this category is intended to provide recreational opportunities for people, young and old. Recreational areas are classified according to their size. In some respects, the size of a recreational area and its geographical characteristics have a bearing on the reason for its existence in terms of the nature of the recreational activities which are allowed to take place within such an area.

Recreational activities can be broadly broken down into active and passive recreation. *Active recreation* includes children's play areas, field areas for football and baseball, tennis courts, swimming, boating, hiking, skiing, riding, camping and golfing. *Passive recreation* includes picnicking, fishing, canoeing and public visits to zoos, arboreturns and botanical gardens.

Parks and other similar places can also be classified as *intensive activities* areas which have a large number of users per unit area, as in picnic grounds or beaches, or as *dispersed activities* areas which require a large unit area per user, e.g., hiking or fishing.



25 Recreational Area (Active)



26 Recreational Area (Passive)



Playgrounds, neighbourhood parks and playing fields are recreational land uses that vary in size from less than an acre to approximately 15 acres. They provide space for intensive recreation by combining facilities for both active and passive pastimes. Such facilities are generally located in urban areas.

Community and district parks vary in size from approximately 40 to 200 acres or more. These parks are established in space that is suitable for intensive recreational activities, that is to say, both passive and active pastimes.

Regional parks are established by two or more local governments for intensive day use by the public. They are generally located in close proximity to urban areas and are intended to complement the provincial park system.

Provincial parks are areas set aside for public outdoor recreation. Their purpose is to provide space for recreational activities, both passive and active, that require a natural environment for such pastimes as camping, swimming, boating, fishing, hunting, hiking, skiing and general enjoyment of nature.

44 *National parks* are areas established with the intention of preserving our most scenic and scientifically unique areas for all time. The parks offer and support a wide range of recreational activities, but they cannot accept high intensity uses that damage the natural setting. The preservation of unique geological formations, flora and fauna is also a paramount requirement in the development of a park.

Wilderness areas are large tracts of land usually exceeding 40,000 acres set aside to preserve the natural environment. The area is resource oriented rather than user oriented. Man is only a visitor in the area and development is limited to trails, portages and rudimentary campsites. Road access is provided to the perimeter only. The purpose of a wilderness area is to allow an individual to spend some of his leisure away from civilization and, psychologically, to assure people in general that large areas of this kind will always remain unspoiled by man.

Practical Interpretations

Federal functions may be located in parks-recreational areas but only if they directly serve or are related to the administration of the park area itself.

Federal functions may be operative close or adjacent to open areas for the purpose of enhancing visual appreciation of the locale and/or to add to the convenience of federal employees' areas that have been established for leisure and relaxation.

Any commercial type of activity which emanates from or is associated with the federal land use should be isolated from park and recreational uses.

When vehicular movements are generated by a nearby federal function ensure that it will not interfere with the recreational concept.

Permissible (conditional) federal uses which may be located in parks recreational areas include (supplementary to the uses already listed): botanical gardens, tree nurseries, arboretums, greenhouses, recreational sports fields, boat liveries, monuments, airport landing fields, nursery schools, museums, public utility installations, parkways, public parking areas, cemeteries, places of worship, penal institutions, fire and police stations, wharves, launching, ranges, non-commercial club premises, etc.



MIXED USES

Often a land parcel, lot or building, is used for more than one of the principal land use functions. A good example of this is a high-rise building with the main floor in use for commercial purposes, the rest of the building being occupied by apartment units. Mixed uses can only be permitted if the zoning regulations allow the apartment units combined with commercial, that is to say, where one complements the other.

There should not be any misunderstanding about the concept of mixed uses. A library combined with general offices does not constitute a mixed use. Two or more major land use activities should exist within one building — such as residential with commercial or public institutional with recreational — to constitute a mixed use.

Mixed uses are not necessarily undesirable in urban areas. If the relationship to the surrounding areas is harmonious and, provided that the building design allows for a clear separation and independent functioning for each of the various uses, such a combination can have a beneficial influence on the area.

A not uncommon town planning problem associated with mixed uses is the functional interference within the unit itself, the causes of which should be examined and eliminated.

Practical Interpretations

Federal activities are best accommodated if mixed uses are avoided.

The combination of commercial (retail) use with a general office function is quite acceptable provided that:

- it is a large-scale project in a central location;
- design allows for clear separation of individual uses within the building; and
- transportation and circulation aspects are solved individually.

Any federal activities combined with residential uses should be avoided.



29 Mixed Uses

This section contains a discussion of controls or restrictions on development which originate through the private sector as opposed to zoning and building regulations which originate through the public sector. Public restrictions on land use are intended to control overdevelopment, overcrowding and other conditions detrimental to health, property values, etc. Private restrictions are in the form of agreements, such as covenants or easements, and nuisance actions as legally arranged by citizens themselves. Nuisance actions, as will be explained, are rarely involved in the development of federal properties. Private agreements, on the other hand, can become rigid encumbrances on the development of federal land and may only be modified or terminated by the consent of the originating parties, depending on the terms of the agreement.

A *covenant* is a private contract which may have a variety of applications. It is generally used to restrict the use of land for certain purposes or to prevent its sale to certain persons, or to accommodate private and special preferences. Covenants are written into property deeds and may be imposed only with the consent of the individual property owner. Depending on the original agreement covenants may be binding on successive land owners and could only be lifted with the originator's agreement.

An *easement* is a legal device whereby certain rights are granted on the use of a property. Easements are created between a property owner and a second party to grant the latter certain privileges for specified uses of the land. They are often used, for example, to establish hiking trails across a number of individual farm properties or to permit the development of above-ground or under-ground utilities across a private property. With the granting of certain rights to a second party, the landowner releases some control over his land. This is important in federal development because easements, like covenants, are often binding on successive owners.

The *nuisance law* is another form of private control of land use designed to eliminate an incompatible land use in those cases where zoning is ineffective. Nuisances may be public or private. Public nuisances are interpreted as being

offensive to public health, morals, or comfort. Private nuisances are activities or structures which unreasonably interfere with a person's use and enjoyment of his property. Environmental pollution is an example of a public nuisance while a gravel pit operation in a residential neighbourhood is an example of a private nuisance. Public nuisance legal action is initiated by the state while private nuisance legal action is initiated by citizens. In federal development, careful site selection with regard to compatibility of land uses will minimize nuisance conditions.

According to the BNA Act (Sec. 92/13) the administration and enforcement of the above legal requirements are within provincial authority.

A special and particularly important form of easement is one that effects the use of *air rights* where municipalities

grant a right to a second party to use the air space over their street right-of-ways. Similar easement may be granted by individual landowners above their present property, for example, rail yards. Such agreements are particularly important in congested urban centres where the above-street level interconnection of smaller land parcels would allow the erection of a large complex.

For proper understanding of the above, these matters should be handled by well-trained legal and realty management personnel. Town planners, however, should familiarize themselves with any encroachments, restrictions or intrusions of other land use functions in order to avoid possible conflicts with the execution of federal functions.

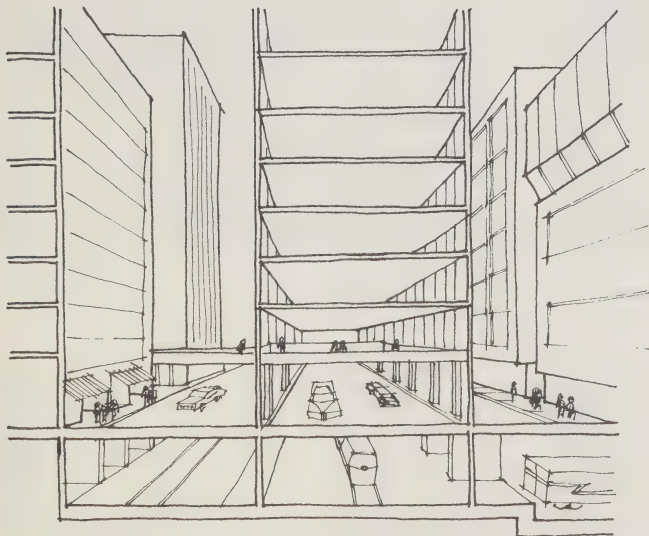
Practical Interpretations

Prior to selecting a site for any federal use all the existing legal restrictions on the use of land should be investigated.

Federal uses which may run contrary to any nuisance law should be coordinated with the local authorities.

The appropriate handling of any legal actions, changes, transfers, etc., should be executed by qualified legal and realty management personnel.

Possible conflict between federal functions and other pre-established rights should be assessed from the town planning point of view.



Air Rights

PRESENT GENERALIZED — FUTURE PROJECTED

The present land use for any piece of land can be generalized and interpreted by means of the land use map. A *generalized land use map* — as opposed to detailed maps — will present a fairly accurate description of the dominant land uses, such as residential, commercial, industrial, etc., without indicating intermittent minor pockets of other non-conforming uses. Depending on the use that will be made of the map, it will show land use, such as residential, as one broad category or separately, as low, medium, and high density residential areas.

These aspects become important when an assessment is made regarding the suitability of a general area for a particular land use function.

A completely integrated land use sector is rather rare. There are usually some functions in the neighbourhood which are in conflict with the proposed federal use. An individual decision should therefore be made by the person who is analyzing the area for a particular project to determine whether the existing generalized land uses would provide a compatible environment.

Every urban area that has a development plan or a master plan and has zoned its undeveloped land can forecast its *future land use*. In this respect zoning is the tool to control the type of land development. If the zoning regulations are followed when development takes place the future land use can then be projected from present zoning. In this manner, generalized land use maps can be projected on a ten- or twenty-years basis for a city.

The same applies in the case of existing uses. All existing or future land uses will include some non-conformities. For the purpose of checking the general compatibility of the likely future development in conjunction with contemplated federal use, sound judgement is imperative. Possible conflicts between existing and proposed uses — those which may result in future alterations to the official plan — and the strength, quality and effectiveness of development controls, should be appraised

in order to determine the likelihood of the plans being implemented. Such considerations usually require the attention of a highly experienced professional town planner.

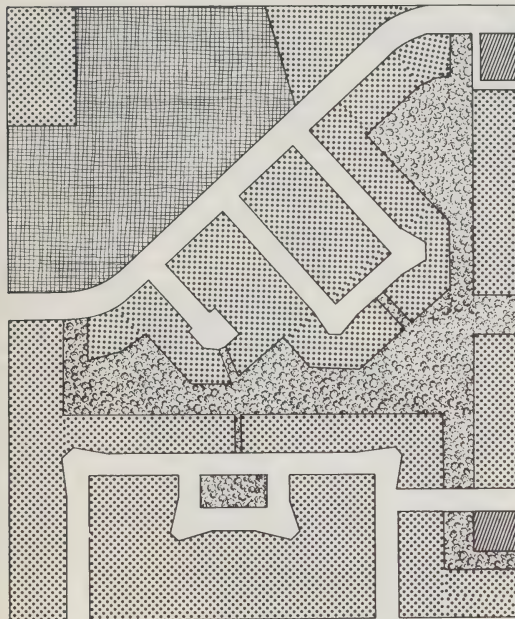
Practical Interpretations

Analyze present land uses in general terms and ensure that sporadic non-conforming uses will likely be systematically eliminated in due course.





Take into consideration the planned future characteristics of projected land uses in the area in order to assess compatibility with the federal activities.

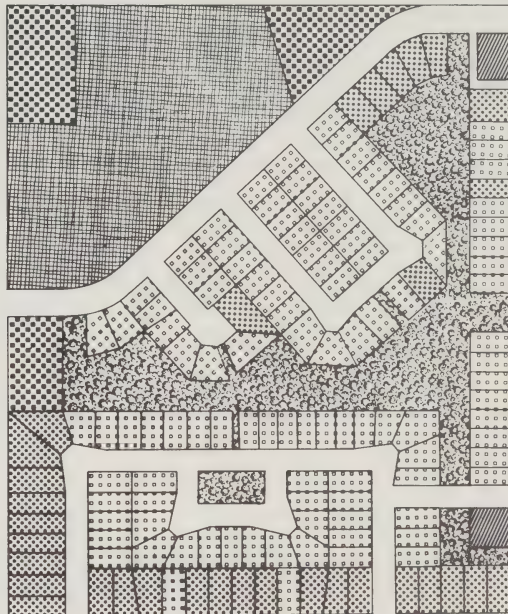
In large-scale or other important projects ask for the help of a highly experienced town planning professional so as to assess the strength of planning controls and predict future development.

Assess the scale and importance of initial inconveniences brought forward by existing incompatible uses and add those factors to the evaluation report regarding the feasibility of the federal project.









Legend

-  Institutional
-  Commercial
-  Park
-  Residential



Legend

-  School
-  Commercial
-  Park
-  High Residential
-  Medium Residential
-  Low Residential

4. Site Selection

50 GENERAL CRITERIA

Selecting the appropriate site for a particular federal activity should be considered from two viewpoints. The Department of Public Works ensures that the federal function will be situated so that all the activities and responsibilities represented by it could be best discharged. In addition, and no less important, the impact of the federal project on the environment and the activities generated by it should be beneficial to the urban setting as a whole.

There are many other factors, other than town planning criteria, which form part of a site selection process. It should be stressed that the town planning aspects must be considered together with other factors — such as commercial potential, price of acquisition, availability, present development, political considerations — and a value judgement should be made about the relative importance of each aspect. It should be emphasized nevertheless, that locations regarded as objectionable from the town planning point of view, insofar as they will cause serious disturbance of normal urban functions, should not be selected. Desirable locations meanwhile, from the town planning point of view, should include a reasonable variety of good alternative selections. This

will enable the other participants in the site selection process to decide how their best principles and interest can be implemented.

Please refer to Appendix 2, *Checklist*, for the criteria to identify the best preferences from the town planning point of view.

The usefulness of this town planner's checklist has already been proved on the basis of previous exercises and experience. It can, in fact, be used by persons who have an intelligent and impartial appreciation of urban values but are not necessarily trained in town planning. However, site selection assessment of large-scale and other important projects, (see *Administration*, Chap. 1) would have to be carried out with the involvement of a professional town planner.

The following Figure 32 is presented to demonstrate some of the general selection criteria through a practical example.

Practical Interpretations

Use the criteria contained in the checklist for selecting sites and apply point ratings, so as to establish the relative merits of the sites investigated.

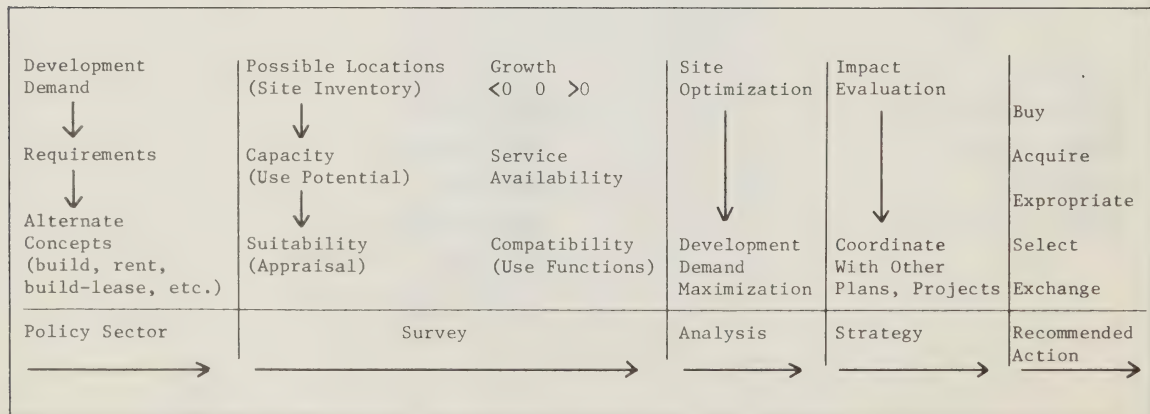
Be concerned not only with the functions of the federal use but also the foreseeable impact on the urban setting.

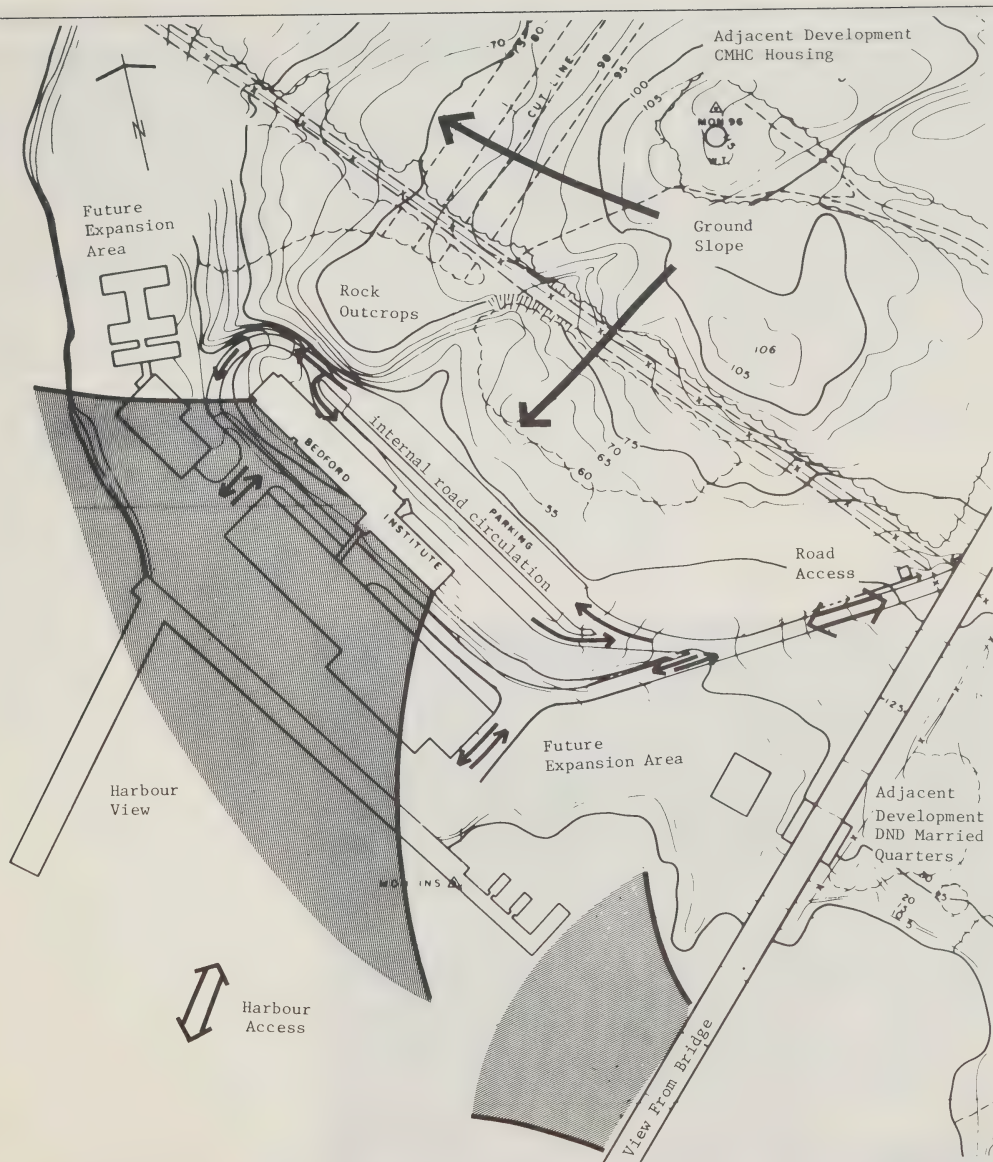
Request professional town planning assistance for large scale and/or more important projects.

Refer the results of the town planning site selection to the other professionals for engineering, architectural, financial and general realty management appraisal.

Make a firm single selection from the town planning point of view — assuming that all other relevant factors have been taken into consideration — but offer possible alternatives which will still be acceptable for good urban development.

If, as a result of thorough investigation, a location is not considered to be acceptable, express this view in no uncertain terms and be fully prepared to defend this recommendation in every detail.





A general visual survey of the site should first be carried out. If the site is not vacant the survey should make it possible to decide whether existing improvements will have to be torn down. The survey will also indicate if the site is level, sloping, low-lying, has rock outcrop, trees and the direction of surface drainage. The requirements for fill or stripping can be "guessed" with reasonably accuracy. The landscaping potential of the site is one of the more important factors and is usually handled by qualified landscape architects.

Information about subsurface conditions is a mandatory requirement for virgin sites when no relevant information is available for similar subsurface structures in the neighbourhood. Data from the surrounding area can only be used for the initial site investigation and should not

be relied upon unless the subsurface is homogeneous. It may, however, still be used as a general indicator of likely substrata and possible problems, such as faults or high water table.

In the final analysis, test bores will be required. The number taken will depend on the type of structure. A sufficient number should be taken to a depth that will be sufficient to show the subsurface strata and provide information for the design of the footings. Large-scale projects or locations in problem areas would certainly require more detailed studies by soil mechanics experts.

Topographical maps and aerial photos can be used to supplement the site survey for large parcels of land. These help to show relevant geological features and surface drainage. They also locate neighbouring structures and show vegetation and roads.

Ground conditions are to be surveyed and listed so as to demonstrate the site's general attractiveness for the planned functions. Sites may be particularly suitable for one project but quite unacceptable for another.

Practical Interpretations

A site visit and survey are essential prerequisites of correct site selection.

Subsurface data should be obtained through test-hole borings in locations where problems with soil conditions or water table could be expected.

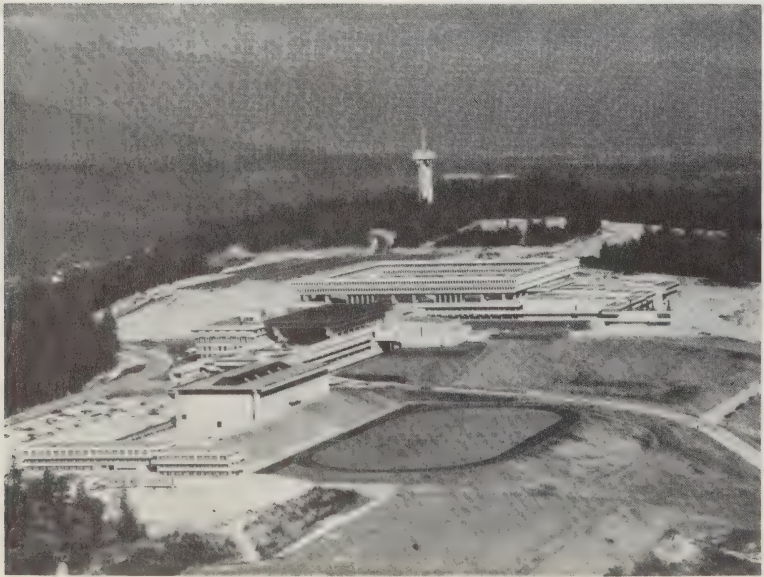
If visual observation is used, consideration should be given to conditions which may prevail during other seasons of the year.

Trees and vegetation are to be regarded as assets and should be preserved whenever possible.

Drainage and water courses should be identified and left undisturbed or treated in accordance with good accepted practice.

For better site development and beautification, seek the advice of a landscape architect who may be involved during the early stages of selection with regards to sites of particular potential or problems of landscaping.

Northern areas have special complications. A ground condition survey should therefore include the advice of a local expert as well.



SITE POTENTIAL

When determining potential uses for a site, all the uses permitted by the zoning authorities should be considered together with any other possible uses. For each use that is taken into consideration the land use capacity must be estimated. *Land use capacity is the identification of a land use which is capable of producing a net return above the costs of production.* Once this has been done, the *highest and best use* for the site can be established. The highest and best use is that which provides the greatest net returns to the owners and to society. (This means, in effect, that there should be no conflict with overall town planning objectives). To satisfy the necessary coordinational needs with ongoing town planning activities the rather economic orientation of highest and best use studies should be supplemented with pure town planning considerations to avoid any harmful impact on the urban "milieu".

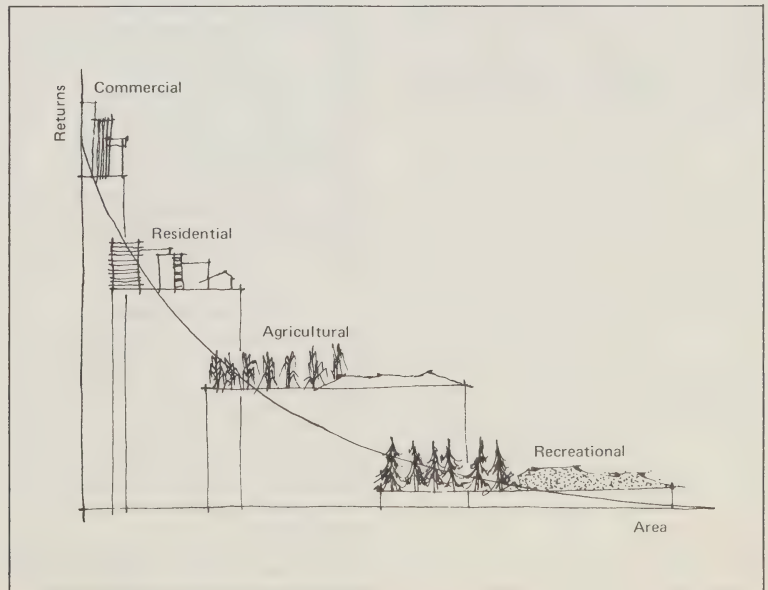
Returns can be measured in monetary terms or by intangible criteria, such as social values and other relevant considerations or some combination of both. Since returns are not only monetary the impact of the proposed use on the urban milieu, on other uses, on overall planning objectives and on local social structures, should also be considered. When a site is examined for its potential uses and in order to determine the land use capacity, several other factors may be considered.

Some examples of these other factors are:

- the relationship of requirements to commercial productivity, such as availability of labour, transportation, and market area;
- the size and shape of the site may influence the uses that are possible, e.g., irregular lots are difficult to use efficiently, certain activities require lots of a minimum size, wide lots are generally more economical to develop than narrow lots;
- the availability of adequate and reasonably priced utilities, such as sewer, water, electricity, gas, and telephone services;
- the topography of the site, slope, drainage, elevation and subsurface conditions (this will affect development costs);
- sufficient vehicular and pedestrian access and egress to the site for the proposed use;
- present uses which may be quite acceptable, e.g., hard to relocate or of historical value; and
- overdevelopment or underdevelopment of a certain area.

Today, land devoted to commercial and industrial enterprises produces greater returns than other types of uses. However, any active demand for business or industrial usage must be considered carefully before a decision is made. If the demand is low, the costs for bringing the land into production could be greater than the returns and result in a loss to the owner.

Often the present use is the highest and best use. If improvements to the site are economical and functional and have a long remaining life, then the costs of demolition may be too high to make any other land use practical.



Highest and Best Land Uses

Site potential can change with changes in technology, demand, land uses and environment of the surrounding area. It can also be affected by public policy and new zoning regulations. For these reasons, land parcels should be reviewed on a regular basis or if major changes (new roads or significant development) occur in the area.

Practical Interpretations

Identify and investigate the potential for various feasible land uses but do not consider the capacity of any land use which is in conflict with overall planning objectives or incompatible with the surrounding environment.

Any recommendation for the highest and best land use must be based not only on monetary returns but be coordinated with long-range interests to the community as well.

Development principles for federal uses should include not only functional and financial success to the proposed use but also a service to the community itself.

Final site selection recommendations should list the potential use capacities in order of priority, including the possibility that the present use be sustained.

Reject any use not consistent with the criteria for genuine development even if capacity studies indicate great returns.

CLIMATIC CONSIDERATIONS

The main determinants of climate are temperature, sun, wind and precipitation. Climate, soil and topography, separately or in one combination or another, can significantly affect the uses to which land can be put in a given area. This is particularly true of land uses, such as outdoor recreation and various types of agriculture.

Climate has another influence which may be reflected directly in values and depreciations. This is the potential the site has for beautification and development.

To some extent, a city creates its own climate. Temperatures are generally warmer near the centre than on the periphery and wind also decreases as one approaches the centre. Some sites have a southerly exposure and receive a lot of sunlight while others may be in the shadow of tall buildings or hills. Other sites may be exposed to prevailing winds and offer a less protected siting for a future use. Prevailing seasonal winds, particularly cold winter winds or cool summer breezes, can affect design concepts. Therefore, construction costs for the same kind of land use can vary considerably from one site to another even within the same urban area. Costs for enclosed walkways, air-conditioning and heating, will vary from one site to another depending on the local climatic characteristics of the site.

Meteorological data for Canada is regularly collected and published by the Canadian Meteorological Service in their monthly records. Climatic information on light, precipitation, temperature, sun and winds can be found for most parts of Canada.

Practical Interpretations

Climatic considerations should be included in the site selection criteria.

Sites that have a main frontage facing north will have a less attractive potential for successful development.

The prevailing wind should be considered in terms of the site's exposure to cold and heat, and as a carrier of possible fumes, gases or other emissions from industrial areas.

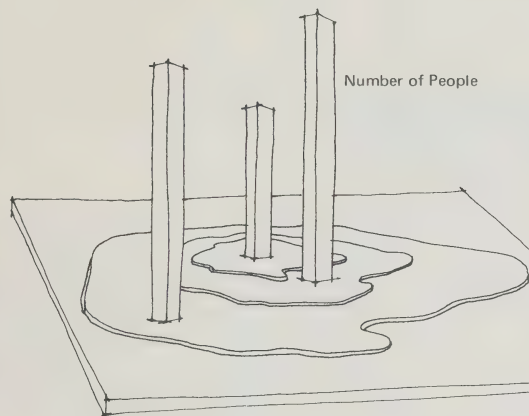
Low sites or pockets sandwiched between higher locations are likely to suffer from snowdrifts and snow accumulation.

POPULATION DISTRIBUTION

There are aspects of population distribution that should be dealt with during the process of selecting a site. One aspect is the location of population or the public that will use or be served by the site and the other is the population or labor force that will be employed there. The site to be selected should be convenient to both. However, preference may be given to one or the other when this is justifiable.

A Canada Manpower Centre or a small Post Office will have a low ratio of employees to clients. For this reason its location will be client or public oriented. However, a large federal building containing many government departments and a large number of employees will usually be located in the central or downtown area of the city. From this central location most of the government departments can adequately serve their clients. This central location is also convenient for the majority of the people who work there. Government departments that cannot serve their clients satisfactorily from this central location should, of course, be re-located accordingly.

The question as to how the population can be best served should be examined. A population that is widely distributed might be served better by several small offices as opposed to one large central office.



Population Densities

Thought should also be given to future patterns of growth of the population. The sites selected should be adequate for existing and future needs. In the same context, the expansion limitations of the site should be known when it is selected. In any event, the site should be part of a future oriented federal accommodation strategy for the area.

When estimating future populations, three projections should be made. The first is the most probable future population. The second is the maximum expected growth; this is used when economies of scale will affect costs significantly, as in a heating plant when costs of building in an excess capacity at the outset would be much lower than increasing its capacity later on. The third is the conservative estimate of growth; this is used when it is best to be "mossback", e.g., when estimating rental revenues or certain market demands.

Planners involved in site selection should also decide whether the community would suffer or benefit from the influence on population distribution engendered by a federal project. For example, where the growth of the population is likely to be locationally modified or quantitatively changed to the extent that activity patterns within the community will be influenced adversely, then discussions with the local authorities should be held to devise ways and means of alleviating or eliminating these negative effects.

Practical Interpretations

Population-change statistics and density maps will be of great assistance in site selection exercises.

Be familiar with the number of employees in the federal buildings, clients served and demands created on various urban service sectors.

In selecting a site, bear in mind the necessity for retaining the existing good balance, alternatively, of influencing the present population distribution to change for the better.

The location of a federal use in one area or another or a particular site within one community will obviously affect the apportioning of employment.

The selection of a city or town for major federal activities is not a town planning consideration. This is the prerogative of higher levels of government and will reflect political, economical, market, distribution, etc. aspects. Once the community is determined, however, locational preferences within the community should include town planning considerations as well. Thus, employment distribution will be one of the important aspects of this planning analysis because the selection of a federal site in one area or another, or as a particular site within one community, will obviously have a subsequent effect on the employment apportioning.

Employment concentration or dispersal within the community will become the determining factor regarding day-time population. In town, this will be manifested, for example, in transportation loads, the use of utilities, the need for service industries and commercial activities.

Federal offices that are intended to accommodate a relatively small number of employees could be located in almost any place where the function is suited to the land use requirements. However, offices designed to accommodate major concentrations of employees must be strategically situated. Dormitory areas with low-density populations should certainly not be selected for a large-scale concentration of employment. High-density residential areas should, however, be reasonably close to employment concentrations in order to ease transportation problems.

Commercial areas can exist in comparative harmony with adjacent employment concentrations. However, no industrial activities should be preferred in close proximity to uses that necessitate higher density employment.

In cities, where only one central nucleus is evident all high concentrations of employment—other than industrial activities—should be in the CBD area. In a multi-nucleus development, where twin and secondary centres are identifiable, a careful and well-balanced distribution of employment would be appropriate.

The necessary information regarding employment figures in various sectors of the community is usually available from the local municipal administration.

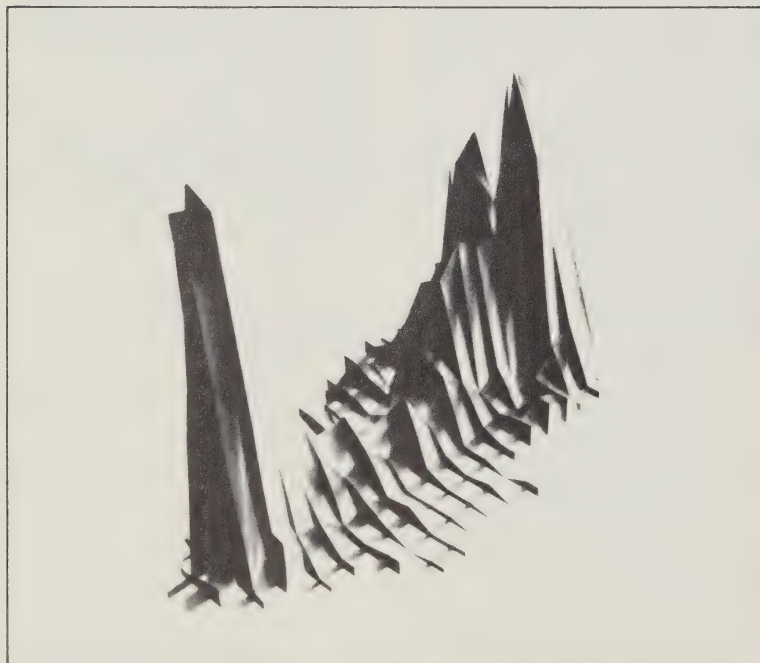
Practical Interpretations

Establish the amount of employment the federal project will provide.

Obtain information from the municipal planning staff regarding the existing distribution of employment.

Translate future development plans into future changes in employment distribution.

Locate the federal project with due regard to a well-balanced employment distribution pattern.



FUNCTIONAL RELATIONSHIP

The expression "compatible environment" already used several times in the preceding discussion, is often referred to by town planners. It is a useful means of equating two very important aspects of the urban life in terms of the proposed use. They are functional relationship and physical surroundings.

These two aspects will be discussed both here and in the following chapter because they should be closely coordinated with federal projects.

With functional land uses (see *General Criteria* in this Chapter) and zoning in mind (see *Zoning* in Chap. 5), the reader should note that *functional relationship is reflected in the interactions that occur between the functions of one existing land use and another*. For the purpose of this discussion structure and appearance may be disregarded and attention concentrated instead on the actual movements and activities generated by the uses. Once these activities are identified a close check should be made to find which — if any — of these functions are in conflict with the day-to-day life and activity patterns of the area.

For example, federal function may have continuous 24-hours activities that are in conflict with residents' normal requirement for quiet night hours. In another situation, where there is a continuous business frontage, interruption of the succession of business activities as a result of a federal office use could well influence pedestrians (shoppers) preferring the opposite sidewalk and patronizing businesses on that side.

Functional land uses already present in a zoning district will determine what kind of federal activity would be considered compatible. An example is presented for this purpose in Table 3 based on data from the city of Milwaukee, USA.



Table 3 — Functional Relationship by Zoning
Zoning Districts

Land Uses.	Resid.	Restd. Office	Ngbhd. Bus.	Local Bus.	Pkg.	Major Comm.	Light Mfg. Comm.	Indus.	Spec.	Agri.	Net Area Used (Acres)
Resid.	48	7	36	26	6	9	12	1	-	-	17,367
Retail	-	-	10	19	3	11	4	1	-	-	822
Office	*	6	4	3	5	7	1	1	-	-	226
Service	-	-	3	4	-	4	2	-	-	-	240
Whlse.	-	-	-	1	1	6	5	10	-	-	1,093
Dur. Mfg.	*	-	-	1	-	2	3	7	-	-	796
Non- Dur. Mfg.	*	-	-	-	-	5	2	3	-	-	321
Trans.	4	7	13	12	70	29	31	28	19	19	5,336
Public	20	3	5	7	1	19	2	3	80	81	7,656
Vacant	28	77	29	17	14	8	38	46	1	0	14,931
Totals	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Total Net Area Zoned	33,188	9	134	2,752	139	356	2,347	9,350	464	49	48,788

*Land area is less than 0.0% of the total.

Source: DCD Field Survey, 1962

The above information reveals that the residential area contains no office use. Wholesale, service and manufacturing activities are hardly represented at all. Consequently, the introduction of any similar federal activity would come into a conflict with the functions that are already present. Industrial areas have some public uses with wholesale and manufacturing well in excess of retail-office-residential uses, most of which are likely non-conformities.

The foregoing examples will serve to indicate that the introduction of a proposed federal activity in a certain sector must not disturb the balance of the functions already in existence there.

Practical Interpretations

Identify all the functions and activities contained in or generated by the federal use.

Learn about the same — both present and proposed — regarding the area surrounding location of the federal program.

Identify all the functions which may be in conflict with the proposed federal activities.

Discuss in the feasibility assessment the importance and possible consequences of conflicting activities and functions.

PHYSICAL ENVIRONMENT

"Compatible environment" should be construed to include the *harmonious physical character* of the adjacent areas as one of the essential components for site investigations.

This means the *physical setting (layout), general appearance and structural condition of the surrounding area and structures*.

For the purpose of discussion under the heading of physical environment the analysis may exclude the living environment and concentrate, for example, on aspects of building conditions, the shape and character of the structures, the style of the buildings, their relationship to open spaces and organized setting.

If a building condition survey is made it should be carried out by means of a *relative rating* whereby the structural condition is grouped into the categories shown in Table 4.

**Table 4 — Building Conditions
(Relative Rating)**

Classification Criteria	
Good	sound condition and appearance, better than the neighbourhood standards. Could not represent more than 25 per cent of the total buildings surveyed
Average	represents prevailing standards in the neighbourhood (51-55 percent)
Poor	includes structures in need of repairs, but still in acceptable structural condition. Should be below average condition (10-25 percent)
Obsolete	structures where no repairs would be economical. Ready for removal (could be up to 49 percent)

Source: HQ Town Planning, 1972



60 The above relative ratings are meant to show that the assessment refers to the area itself and a "good" rating applies to better than the average in this particular area. However, this does not necessarily indicate excellent structures. By applying the above relative rating it is now possible to relate the assessment to the general area itself without setting up complicated and merely hypothetical criteria for sophisticated rating exercises.

Building styles, design details, outside finishing, material, decorations, volumes, massing and grouping will all be factors to be considered with the physical appearance. The general physical concept of the development — park-like setting, high-rise concentrations mixture of decorative and utilitarian development, etc. — would also form part of the process of assessing the compatibility of the physical environment.

One of the most important aspects of this exercise is to delineate the area that will have a direct influence on the site that is being investigated. This could include a few blocks or more depending on densities, approach routes, views, etc. Individual judgement should be applied and the area of investigation defined right at the beginning of the exercise.

Practical Interpretations

Define the area that will have a direct influence on the site.

Establish the average building condition by surveying (visual only) all the structures in the study area.

Group the buildings into appropriate categories and decide if the results will complement or impair the appearance of the federal structure in that setting.

Identify the character (style) of the area in order to provide advice that will assist in finding a satisfactory appearance for the federal building.

Survey the general layout (pattern) of the area to see if the federal structure could be embodied in the setting.

COMPREHENSIVE (MASTER) PLANNING COORDINATION

All major Canadian cities have comprehensive plans to regulate future development. Federal structures should, therefore, be in accordance with the general principles inherent in such plans.

Characteristics and objectives of the Master Plan should be clearly understood by federal planners if a site selection complementary to planning objectives is expected.

It is not necessary here to enter into an analysis of the sophisticated details related to the master planning exercise. However, it will be useful to summarize the subject — presented in Table 5 — in order to provide a broad understanding of the requirements in the master plan that are to be investigated if sites for federal activities are selected.

Table 5 — Master Plan Objectives

Objective	The Plan provides:
Policy Determination	desirable overall development concepts, alternatives, correction to present problems
Project Review	setting of desirables against various current interests (current plan approval)
Technical Guide	assistance regarding technical requirements during the design process

Source: Assembly of California, 1955

The Table 5 indicates that the overall objectives of the master plan would include references regarding centralized or dispersed development, new subcenters (if any), directional growth, rate of growth, etc. It will also identify development types that are not desirable and to be avoided. The technical details, usually contained in the development regulations and sector plan details, would be of assistance in identifying the appropriate site selection criteria.

Table 6 shows types and some properties of the master plan.

Table 6 — Master Plan Types

Planning Period	Action	Aims	Purpose
A. Conceptual — regulatory (national, social, economical, methodical, basic, enterprising)			
25-30 years	formulating goals	goals	general course setting
10-20 years	general planning	objectives	strategy
B. Functional — sector (technical, conservative, specific, improving)			
3-7 years	program planning	targets	coordination
1 year	project planning	assignments	annual budget estimates

Source: HQ Town Planning Section, 1972

Thus, the information in Table 6 makes it evident that detailed locations for specific projects may only be found in short-range plans. Only the functional plans (not the conceptual or overall plans) are pertinent to details for specific locations. Whereas the "A" type of master plans will assist higher authorities to locate certain federal functions in a particular community, the "B" plans would be of use only for selecting the corresponding site within the city.

It should also be clearly understood that the details and small-scale (neighbourhood) *locational preferences are regarded as flexible* in any master plan and only the long-range conceptual approach and overall objectives are set. *Principles of land use proportions are rigidly* formulated (balanced) and should not be violated by major development projects that are located in contradiction to it.

Practical Interpretations

Provisions of the Master Plan should be studied prior to site selection.

Districts where the federal project will comply with the fixed and rigid requirements of the Master Plan should be identified.

Only those areas where the Master Plan welcomes the proposed federal use, should be investigated and surveyed.

Actual locations within a given sector are usually not specified in the cities' Master Plan.

The local municipal planning office should be approached for assistance.

Major projects will require town planning professional advice.

62 **NEIGHBOURHOOD CONCEPT**

The neighbourhood concept has had various definitions and interpretations ascribed to it in the past. The only general definition which may be applied hereby is that it refers to a residential unit within a larger community. The concept had its origin in the neighbourhood unit described by Clarence A. Perry in 1939. This concept referred to a residential area of a population size that could support one elementary school. He placed this figure at 5,000 people. It would have central facilities to serve the neighbourhood, an internal network of streets which would link with external arterials, and recreational or open space of about ten percent of the total area of about 160 acres.

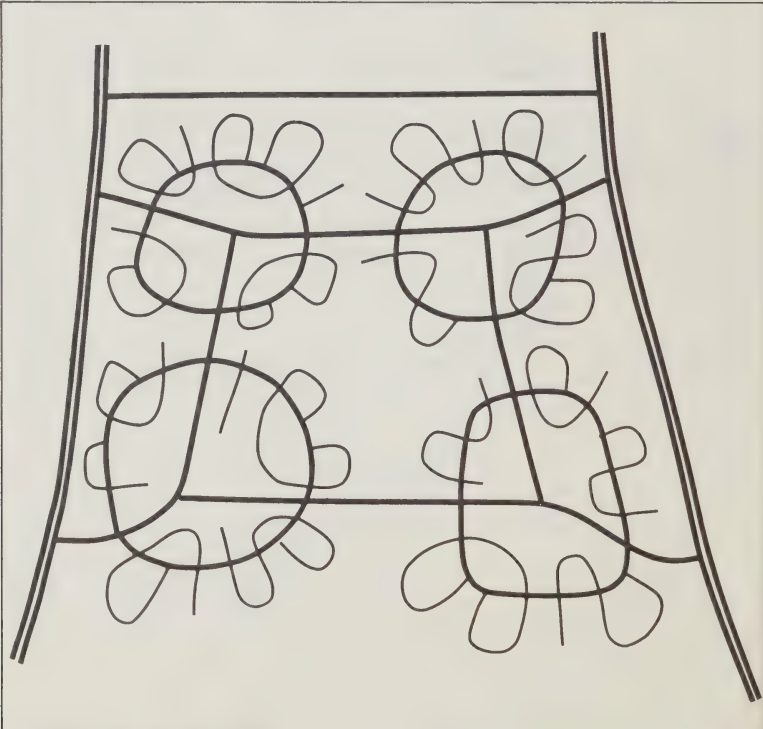
Other principal characteristics included the requirements that no arterial roads or other physical barriers should bisect the unit and school children should live within a 1/2 mile walking distance from the neighbourhood school.

Clarence Stein later also elaborated this concept by grouping such neighbourhood units to form larger areas that could be served by larger commercial centres and a high school.

The early conceptualization of the neighbourhood was well defined and, in North

America, was applied in such experiments as Radburn, New Jersey. Later interpretations have been much more liberal. The components are similar: predominantly residential land use but also schools, local shops and services, open space, and perhaps a neighbourhood centre. Other criteria, such as size and identity are now in question. The controversy has arisen because the neighbourhood is not now regarded as a valid functional unit by many planners. It is evident that people do interact far beyond the bounds of their immediate neighbourhood for social, educational, occupational, and recreational pursuits. Greater physical mobility imparted by the use of the automobile, for example, makes them less dependent on neighbourhood facilities.

The primary character of the neighbourhood is still that of a residential district, but the size range is now considered, by those who deem the concept valid, to be between 5,000 to 10,000 people and in residential areas up to one square mile. Changes and variations in the educational system have neutralized the concept and use of the elementary school as the main component of a neighbourhood. Furthermore, there is a question of identity. As neighbourhoods are not physical planning units, they are not defined or bounded. Moreover, conceptions of a neighbourhood may vary greatly among residents.



With the variations in the interpretations of the concept, neighbourhood can now be understood as referring to a residential area in which:

- the residents commonly recognize some association with each other based on similarities of socio-economic status, or their desires in general for the future of the area; and
- shape forms an intelligibly identifiable functional unit not divided by any physical or traffic barriers.

It is not necessarily homogeneous. Nor is it a self-contained unit, but rather an identifiable component unit of a larger urban complex. Federal development may have an impact on such a "perceived" neighbourhood. This impact may be circulatory, aesthetic, economic, etc., but it will be on a lesser scale than that of a community impact.

Practical Interpretations

Planning for or within a neighbourhood must involve the principles of town planning in accordance with this publication. Of most importance are those principles relating to land subdivision, circulation, and the provision of community facilities. As part of an urban whole, however, the neighbourhood must not be considered out of its larger context.

The siting of any federal development should respect prevalent perceptions of the neighbourhood. If a neighbourhood is strongly identified by a group of residents, the development will have an impact on that conception. Any one impact must be identified with other possible impacts to discover whether the benefits are being maximized and the negative effects minimized.

Neighbourhood facilities should be centrally located to equalize accessibility. A federal development that is not directly identifiable with local functions or does not serve the neighbourhood itself should, preferably, be in a peripheral location more directly accessible to major transportation channels.



5. Site Controls

64

FACTORS CONDITIONING THE USE OF CONTROLS

Planning control arises from the fact that persons, groups of persons and organizations wish to initiate some form of development. Constant change in the physical environment, together with continuous and increasing needs of various sectors of society, necessitate some means of control to protect those who would be undesirably affected by certain proposed developments, and thus to modify some or all of the undesirable trends.

In essence, controls do make it possible to put into practice those proposals which are in accordance with a municipal land use plan. Moreover, they do guide projects onto those sites for which they are most fitted and thereby preserve other sites against the intrusion of undesirable trends. They protect the character of an area and at the same time, remain profitable or convenient to the developer, meanwhile revealing and creating new directions in development.

For the most part controls in land development are conditioned by four major elements to public interest.

Health and safety — with a strong emphasis on constraints to prevent conditions injurious or hazardous to the physical well being of the community, such as density controls, controls over hazardous areas including mines, airports and railroad tracks, control of exposure to adverse environmental conditions such as flooding, etc.

Convenience — in the location of land use areas and intensity of development.

Economy — with regard to location, use and intensity of development and

Amenity — which is concerned with the essential pleasantness and aesthetic qualities of the urban environment as a satisfactory place in which to live, work and spend one's leisure time.

Practical Interpretations

Federal development does not require authorization (permits) by a municipal government. DPW nevertheless applies for building permits and complies with development requirements as a policy.

Submit plans and specifications to the municipality for the issuance of a "certificate of zoning compliance" and a building permit.

If an agreement cannot be reached with the municipality to obtain a building permit submit a request to DPW management for authorization to build despite objections from local authorities.

Building in conflict with municipal requirements is to be avoided, if possible.

The site selection process for federal development should include health and safety, convenience and amenity considerations and decisions should not be based on the economic (financial) aspects only.

The town planning specialist input should be an integral part of the process of site selection for all major or more important projects, such as those listed under *Administration* in Chapter 1.

ZONING

The direction and control of orderly land use is without doubt the most important feature of a sound planning program. For that purpose, comprehensive zoning is the most effective tool which planners presently have at their command.

Definition

Essentially, *zoning* is a means of ensuring that the land uses of a community are not only properly situated in relation to one another, but also have adequate space for each type of development. Zoning also allows for the control of development density in each area so that property can be effectively serviced by means of a corresponding extension of the existing services. This encourages new growth in appropriate areas. By the same token, individual property is protected to the extent that certain requirements can still be met while, at the same time, property values remain stabilized and preserved.

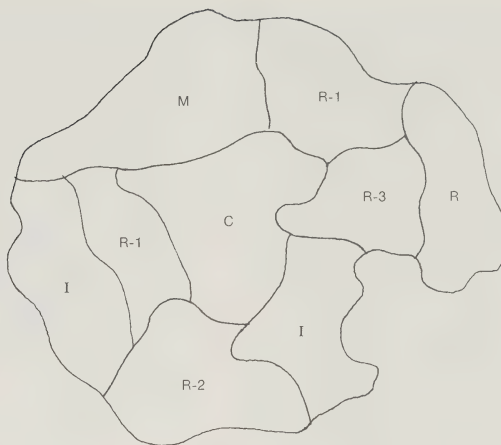
Briefly, zoning may be defined as the division of a municipality into districts and in terms of development criteria within such districts. The criteria might be:

- height, bulk and physical appearance of buildings and other structures;
- area of a lot which may be occupied
- size of the required open spaces;
- density of population;
- use of buildings and land for retail or commerce, industry, residence, recreation or other purposes, (including ancillary uses).

In addition zoning must have a substantial and specific relation to the general public welfare in such matters as health, safety, convenience. It must also be in accordance with a comprehensive plan.

Thus, zoning represents the subordination of personal interest in favour of the public interest through procedures established by law.

See also *Functional Categories and Descriptions* at the end of this section.



Zoning enforces land uses.

Purpose of Zoning

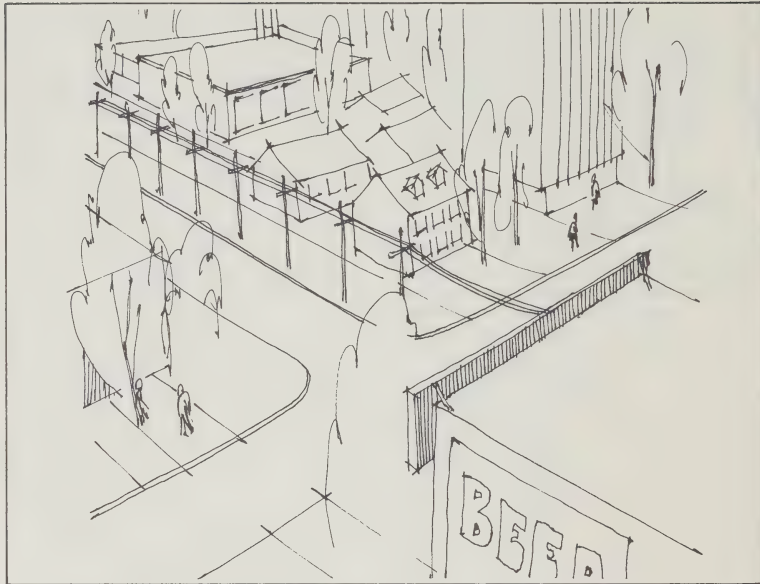
The basic *purpose of zoning* is to regulate and coordinate land uses. There are also some other purposes of zoning which have a very much wider scope. These are:

- the protection of property values by means of orderly development and minimizing conflicting or nonconforming uses;
- stabilizing the neighbourhoods by a technique of preservation and the introduction of developments which are homogeneous with the surrounding area;
- regulating competition by means of districting;
- moving traffic rapidly and safely in order to lessen congestion;
- controlling the aesthetic appearance of the neighbourhood;
- limiting densities by setting a minimum lot size and minimum floor space;
- preserving cultural and historic areas, natural scenery and the environs of public property;
- increasing the tax base; and
- promoting morals.

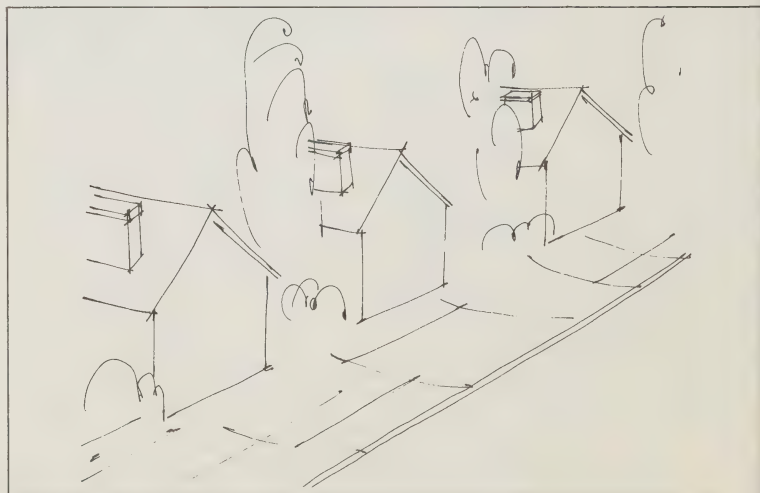
By-Laws

Zoning by-laws are passed for the purpose of implementation. This is done by the councils of local municipalities. The jurisdiction of a municipal council to pass by-laws is delegated to it by the Provincial Legislature, which has a broad and general authority to make laws in relation to municipal institutions in the province under S.92(8) of the B.N.A. Act.

A zoning by-law may not be adopted unless it has had a hearing and a municipal board approves it. In addition the applicant must satisfy the Board as to the legality of the enactment. The burden of proof is on the applicant seeking approval of a by-law or an amendment. Also, in most provinces of Canada, a zoning by-law must be approved by some provincial authority before it can be implemented.



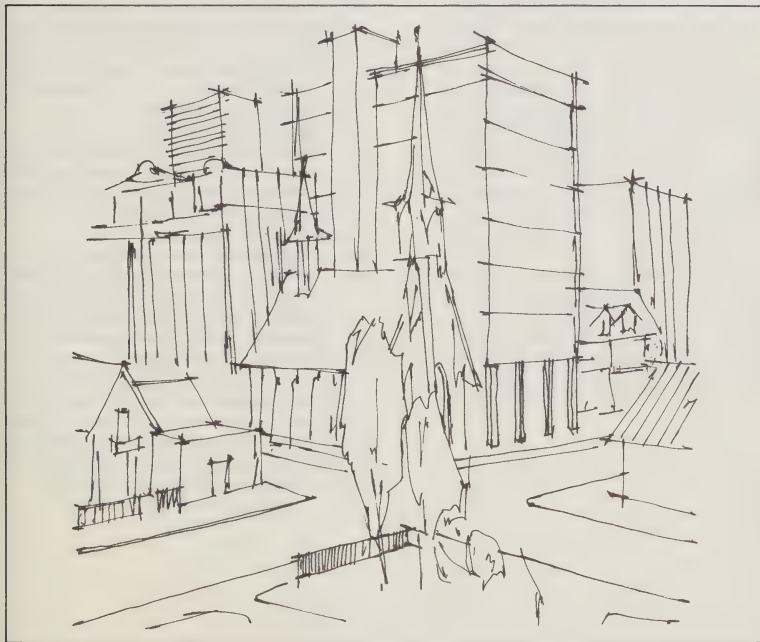
Zoning is a total to prevent incompatible and uneconomical land use like this.



But it should not result in monotonous development like this.



Zoning should preserve important views.



Zoning should prevent disorderly urban development.

Because zoning is a legal statement of what land use will or will not be acceptable to a controlling authority, it therefore represents a potential modification of the free market situation. However, this is not an inflexible condition since, in fact, zoning boards often follow the dictates of the market and even try to anticipate them, both in framing the regulations and in granting exemptions and variances. Zoning, indeed, discriminates for or against certain land areas.

Legal actions, however, to recover potential losses caused by zoning would not be successful if:

- the zoning regulation is based on a comprehensive overall land use program;
- it leaves the owner at least one reasonable choice to use his land;
- the zoning by-law was properly passed and is implemented within the law.

In every zoning by-law there are certain uses for each of the categories which are primary, and are permitted as a matter of right anywhere in that particular zone. On the one hand, the granting of such a *permitted use* is straightforward and does not require official consent by a council or a board. On the other hand, *conditional use* is permitted only if certain conditions set forth by the approving authority are met and, for this reason, requires the individual approval of an administrative body (Zoning Board). Permitted and conditional uses are usually listed individually for each zoning category.

Zoning by-laws also make provision for *non-conforming uses*. This is a term which can cover buildings as well as activities. Non-conformities are created because zoning regulations are never retroactive. Thus, activities that are contradictory to zoning are tolerated if they were in existence at the time of the enactment of the by-law. Only normal upkeep is permitted, no expansion and no reinstatement of an interrupted use would be allowed.

Because certain consequences concerning establishment, continuance and termination of non-conforming uses may depend on the classification, it is convenient here to discuss four varieties of non-conforming uses. These include non-conforming buildings, conforming uses of non-conforming buildings, non-conforming uses of conforming buildings and non-conforming uses of land. Just as applications for conditional uses must meet the approval of an administrative body, so too must non-conforming uses.

There is, of late, pervasive tendency in zoning towards greater flexibility. The federal government does, in some cases, ignore zoning by-laws because it has the authority to do so. It is true, of course, that most zoning by-laws do have in their preamble a statement to the effect that the federal government need not comply with the zoning regulations outlined. But, although the federal government does not necessarily have to agree with the zoning regulations of a specific area there are several factors which stress the need for conformity to the by-laws. One of the greatest problems which may arise in relation to zoning is the probability of public discontent for one reason or another. It is, indeed, a vexing problem which, in its extreme form, may harm the image of the federal government and bring it into grave disfavour with the public. A second problem which could arise as a result from a disregard of zoning regulations is that of economic obsolescence of a structure if it is built in an erroneous location.

In such a case the rent payable to the government may be lowered unnecessarily and, eventually, be exceedingly difficult to sell. The final problem which may arise is that of conflict with other land uses if a structure is built in an area not zoned for that purpose.

Functional Categories and Descriptions

Every zoning by-law includes references to a certain number of functional use categories the designations of which may, however, vary between one municipality and another. In effect, these categories specify the uses of particular tracts of land. The following is a general list of these categories together with commonly accepted abbreviations and descriptions:

- O *Non-zoning* — Land for which no use has been designated by the municipal authorities. Usually found in an unorganized or loosely controlled peripheral area.
- A *Agricultural (rural)* — Located far enough away from the urbanized area that the dominant uses permitted in the area are associated with agriculture.

- AR *Agricultural (future residential)* — An area that presently permits agricultural activities but is slated for future residential functions (deferred development).
- AM *Agricultural (future industrial)* — An area that presently permits agricultural activities but is slated for future industrial functions (deferred development).
- RE *Country Residential* — A rural or recreational area that allows permanent homes or cottages on larger sites (estate residential). Not usually served by any public utilities.
- RR *Restricted Residential (single family)* — Single detached houses with an average density of 1 to 6 houses per gross acre.
- RA *Residential, Single, Double (low density)* — Single family houses and duplexes or semi-detached houses with an average density of 7 to 12 dwelling units per gross acre.
- RB *Residential, General (medium density)* — Includes fourplexes, row houses, town houses, two- and three-storey apartments. The average density is about 10 to 20 dwelling units per gross acre.
- RC *Residential, Apartments (high density)* — This category is used for apartment blocks that are in excess of three storeys in height. The average density is in excess of 15 dwelling units per gross acre.
- CS *Commercial Service (local)* — This allows convenient services that supply a local neighbourhood such as a drug store, dry cleaning, laundromat, bank and hardware store.
- CG *General Commercial* — Includes large regional shopping centres or businesses not located in central areas and which draw from a large area. Examples would be automobile dealer, motor hotel, theatre, medical and dental offices, bowling alley and farmers' markets.

CM *Central Business District* — This is the core of the city or town and the permitted uses are defined as those directly related to the retailing of goods and services and the performance of various office functions. The permitted uses also include recreational, cultural and service activities. Some examples of permitted uses are department stores, theatres, office buildings, storage warehouse, wholesale serving local retailers and civic centres.

CH *Highway Commercial* — Covers commercial establishments that need highway frontage. Some examples are motels, drive-in roadside services such as restaurants, outdoor theatres, veterinary clinic, service stations, businesses that sell boats or heavy equipment or farm machinery and wholesalers.

ML *Industrial* — This category allows for light industrial uses that do not produce noise or odours. Some examples are warehouses, freighting or transport terminals, plants that assemble or manufacture light metal products, pharmaceuticals, food products, plastics, ceramics, textiles, furniture or other similar products usually identified with light industry and consistent with this category.

MH *Heavy Industrial* — Permits heavy industries that do not generate noise, odours or vibrations. Examples of these uses are equipment assembly plants, machine shops, bulk-oil storage and other similar uses.

MS *Special (restricted) Industrial* — Heavy and light industries that emit dust, smoke, noise, odours or vibrations. Examples are railway shops and marshalling yards, salvage or scrap yards, oil refineries, manufacturers of chemicals and cement products, generators of electricity or other similar industries consistent with this category.

DC *(Direct Control (not yet specified))* — Land for which no use has been designated. Development plans are assessed on their merits by the planning authority that is empowered to reject or okay the plans.

T *Transitional* — Areas that are undergoing change in land use. An example of this is a residential area that is slowly being taken over by the central business district. Previous uses are tolerated, but transition to the new use is encouraged.

P *Parks and Recreational* — Includes natural parks such as national parks, sanctuaries and wilderness areas. Also includes man-made parks for active recreation, such as athletic fields, ski resorts, boat liveries and parks for passive recreation, such as zoos and botanical gardens.

C *Conservation Area* — Used to preserve natural features, such as water sheds, marshes, creeks, escarpments and green belts.

PI *Public Institutional* — Includes public land uses, such as hospitals, schools, churches, civic centres, libraries, police and fire stations.

G *Government* — Used for government functions, such as court-houses, health clinics, government offices, employment office and post offices.

GR *Government Restricted* — Includes specific government functions at the discretion of government authorities.

NOTE: Some zoning by-laws could also use zoning categories not included in the foregoing list. In that event, it would then be necessary to pick a zoning category from the above list that would best suit the description given.

The following Table 7 is presented so as to group the above zoning categories previously explained into a readable and handy tabulation of land uses for the reader who is not familiar with the special "jargon" used by planning agencies.

Most of the zoning categories could, of course, be further broken down into sub-zoning districts, but these would vary considerably from one municipality to another.

Another practical example — taken from a survey in the US City of Milwaukee — is presented in Table 8 to show how various zoning districts are actually used. Table 8 presents a practical example of how zoning works.

The Table 8 also serves to show that zoning districts do contain (to a minor extent) other land uses, too, and that these are regarded as compatible uses or as tolerable non-conformities.

Table 7 — Zoning Categories and Land Uses

Zoning Categories	Country	Residential	Commercial	Industrial	Special	Parks	Institutional
No Zoning	O						
Agricultural	A						
Agric. Future							
Residential	AR						
Agric. Future							
Industrial	AM						
Country							
Residential	RE						
Restricted							
Residential		RR					
Residential							
(low density)		RA					
Residential							
(medium density)		RB					
Residential							
(high density)		RC					
Commercial							
Service (local)			CS				
General							
Commercial			CG				
Central							
Business							
District			CM				
Highway							
Commercial			CH				
Light							
Industrial				ML			
Heavy							
Industrial				MH			
Special							
Industrial							
(offensive)				MS			
Direct							
Control					DC		
Transitional					T		
Parks and						P	
Recreational						C	
Conservation							
Public —							
Institutional							PI
Government							G
Government							
Restricted							GR

Source: DPW-HQ. Town Planning, 1972

Table 8 — Distribution of Land by Zoning District

Zoning Dists.	Resid.	Retail	Office	Service	Whlse.	Dur.	Non-Dur.	Trans.	Public	Vacant	Net Area Used (Acres)
Restd.	91	10	6	13	2	2	2	25	86	62	33,188
Office	*	—	—	—	—	—	—	*	*	*	9
Ngbhd.	—	2	2	2	*	—	—	—	—	—	134
Busi.	—	—	—	—	—	—	—	—	—	—	—
Local	6	65	38	49	3	1	2	6	2	3	2,752
Busi.	—	—	—	—	—	—	—	—	—	—	—
Parking	*	—	4	—	—	—	—	2	*	—	139
Major	—	5	12	5	2	1	6	2	1	—	356
Comm.	—	—	—	—	—	—	—	—	—	—	—
Light	2	11	8	15	10	9	17	14	1	6	2,347
Mfg.	—	—	—	—	—	—	—	—	—	—	—
Comm.	—	—	—	—	—	—	—	—	—	—	—
Indus.	1	7	30	16	83	87	73	49	4	29	9,350
Special	—	—	—	—	—	—	—	2	5	—	464
Planned	—	—	—	—	—	—	—	—	—	*	10
Devel.	—	—	—	—	—	—	—	—	—	—	—
Agri.	—	—	—	—	—	—	—	—	1	*	49
Totals	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	—
Total	17,367	822	226	240	1,093	796	321	5,336	7,656	14,941	48,798

*Land area is less than 0.1% of the total.

Source: DCD Field Survey, 1962

Practical Interpretations

Enquiries should be made at the municipal offices for the zoning map and by-laws pertaining to the area in which interest is held. See *By-Laws*, under *Zoning*, in this chapter.

It is necessary to be familiar with the relevant zoning maps and by-laws.

Analyse carefully all functions of the federal structure for appropriate placement in the correct zoning category.

Identify all functions generated by the federal structure and consider the impact on other zoned areas.

Make a check to see whether compliance with the zoning requirements would influence the design, size, appearance, economy, etc., of the federal structure.

Government functions should, whenever possible, be located in accordance with zoning regulations.

If a zoning change or relaxation of requirements is required, representation should be made to the appropriate forum via the DPW office responsible for the area.

Non-conforming government activities should be considered for relocation as soon as possible and expansion of the non-conforming use should not be allowed.

Consider zoning as a protection to the value of the federal program and not as a restriction.

HEIGHT RESTRICTIONS

One of the important controls allowed for in a zoning by-law is the one concerning height restrictions. Modern zoning by-laws usually control heights indirectly by the application of the Floor Space Index (FSI) factor and various bonuses that are added to it. See also *Bulk Regulations and Floor Space Index* in the following section.

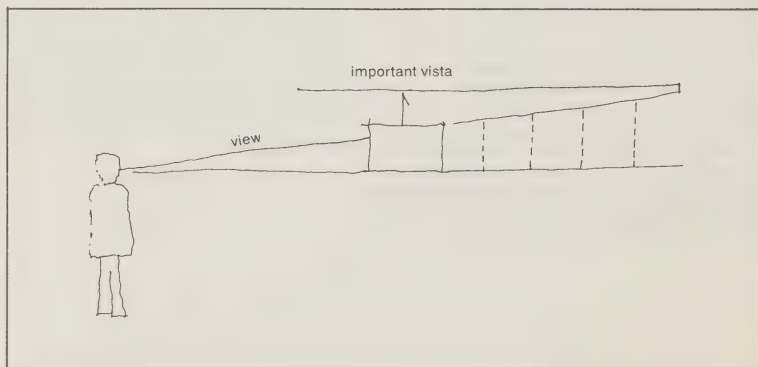
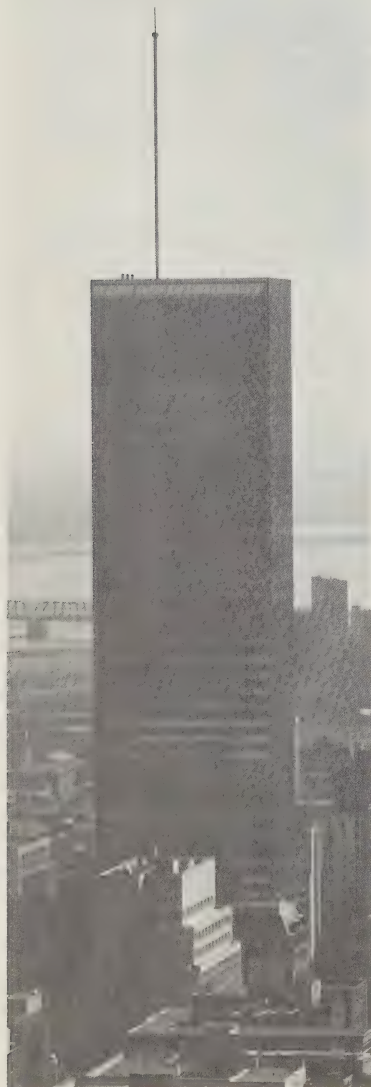
Certain areas, however, require direct height controls, hence, the need for a discussion of these aspects. Height regulations prescribe an envelope outside of which a structure shall not extend. Nevertheless, variances can frequently be allowed. However, there must be safeguards against over-shadowing, the blocking out of desirable views or the interferences with views, particularly with regard to public buildings. To this end, regulations are imposed to:

- secure safety from fire;
- provide adequate light and air;
- prevent the overcrowding of land and capacity of the streets; and
- observe aesthetic reasons.

The building height itself is determined by measuring the vertical distance from the established grade to the highest point of the roof surface for flat roofs, to the deck of mansard roofs, and to the average height between eaves and ridge for gable, hip and gambrel roofs. It may be expressed in feet, stories, or with reference to the width of the street on which a building fronts. When using feet measurements to determine building heights, specification should normally be made to the exact manner in which measurements are to be made and, thereby, avoid the possibility of subsequent disputes.

It is interesting to note that height per se is not always an economic variable. The revenue generated by any project is directly related to the leasable floor area. Although the rent in upper floors of a high office building customarily are at a premium, there are higher costs associated with construction. With a constant total floor area, the higher the building the lower the ratio of total leasable space due to the increase in area taken up by additional elevators, hallways and rest rooms. Furthermore, there are increased costs in footings, columns, and other structural members.

Height limitations vary according to land use as well as city ordinances. Nonetheless, there are some common height limitations. For example, in single and two-family residence districts heights are



Height restrictions are to preserve vistas.

often restricted to 25 feet or two and one-half stories. In apartment districts they may range up to 150 feet or 15 stories. Central business districts on the other hand, frequently have no height limitations; only FSI restrictions are applicable.

In addition there is a special, more restrictive type of height limitation which is imposed on structures in the vicinity of airports.

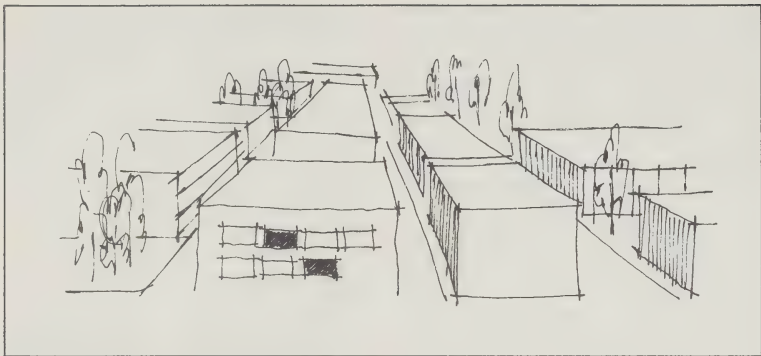
All the foregoing limitations refer to maximum building heights.

A few cities have attempted to fix maximum building heights for the central business district mainly for reasons of land scarcity, but there are other reasons as well.

In Ottawa, for example, height control in the centre is based on three aesthetic, but nonetheless practical, principles: the remaining vistas of the Parliament Buildings must be saved; the scale of Parliament Square must be maintained; and the symbolism of the Peace Tower must be preserved. Thus, a height limitation is imposed according to the distance of a given structure from the Parliament Buildings.



This could be Parliament in Ottawa overpowered by uncontrolled development



Unnecessarily restrictive height control through zoning can result in dullness as well as uniformity.

Other than the height limitations imposed by the federal government, the government itself may choose not to comply with stated regulations. But, for reasons already mentioned, it is under an obligation to make an effort to follow the specified height restrictions as a general rule simply because they are necessary to create or sustain a satisfactory living, working and playing environment.

Practical Interpretations

Building height regulations, if any, are to be investigated and understood.

Determine the exact manner in which height measurements of buildings are to be made in order to avoid the possibility of subsequent disputes.

No public buildings should be erected with less than 10 foot vertical distance between floor levels.

Federal structures should be erected with a minimum of 50 foot horizontal distance from the nearest building on frontage. However, this distance, preferably, shall not be less than the height of the building opposite.

BULK REGULATIONS AND FLOOR SPACE INDEX

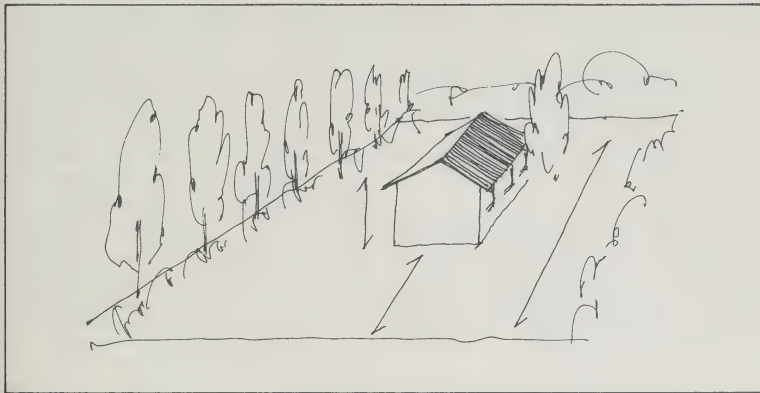
Bulk Regulations — are those which provide a zoning envelope for buildings by horizontal measurement. They usually refer to the size and shape of buildings and their location on the land. They also include such regulations as minimum lot size, minimum frontage of lots, the area of a lot that may be covered, yard requirements and setbacks, etc.

Bulk regulations are not unlike those pertaining to height in that they also prescribe an envelope outside of which the structure shall not extend, however, hereto, variances are frequently allowed. As well, the regulations are imposed in the interests of safety, adequate light and air, to prevent overcrowding of land, to avoid the overloading of streets, and for aesthetic reasons.

Floor Space Index (FSI) — This is a device that combines height and bulk provisions. It specifies the relationships between the total area of permitted floor space in a structure and the total area of the lot on which it is situated.

FSI is designated for a particular zone and tells the developer the maximum square feet of building floor area he may put on a given number of square feet of land. It may be divided among as many stories as is economically feasible. For example, an FSI of 1.0 permits the builder to erect a one-storey building covering the entire lot, a two-storey building covering one-half of the lot, a four-storey building covering one-quarter of the lot, and so on. In this way the FSI factor provides an inducement to the builder to leave more of his lot open by permitting him to build higher.

The FSI differs according to the classes of districts. It may be 0.7 for residential areas whereas, in business districts, it may begin at 1.0 and increase to 12.0 or more. Any such regulations should, nonetheless reflect an analysis of existing structures in order to determine what is reasonable in any given district. In considering the FSI there are also some basic elements which must be kept in mind.



These specify the number of square feet of tract devoted to open space, living space and recreational space. In addition, the FSI itself is a very economic variable. The amount of revenue-producing space which can be placed on a given parcel of land is controlled by the allowable FSI. Thus, any increase in FSI, either by rezoning or by the use of bonuses, will result in a greater return to the owner.

In determining the FSI for government buildings or any buildings, it is therefore necessary to decide the type of use to which the structure will be put.

Practical Interpretations

Determine the bulk restrictions of the area through enquiries to municipal authorities.

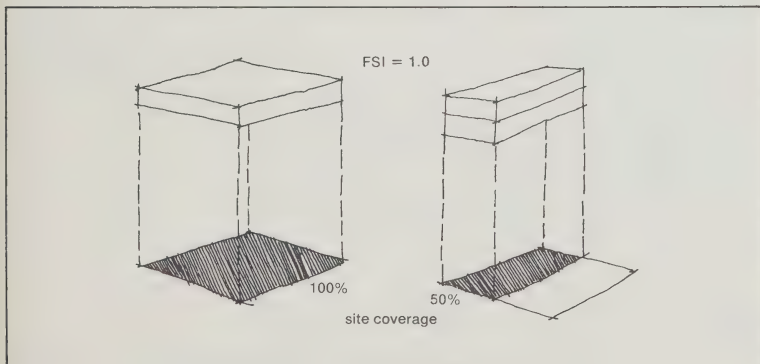
If variations or amendments are required with regard to minimum lot size, minimum frontage of lots, and yard requirements or setbacks, proceed in accordance with zoning by-law amendments.

Enquire as to the FSI for buildings of the particular area in which interest is held.

Avoid overly high and bulky structures which create undesirably large shadows or otherwise impair or destroy pleasant vistas.

At all times attempt to plan in accordance with the municipality's overall comprehensive plan, and in co-operation with municipal authorities.

Permitted Bulk



Floor Ratios — FSI

Population density refers to the population concentration within a specific area and is a measure of the designed population capacity of urban land.

It is usually grouped into three basic categories: *low density*, where there is a wide dispersal of population and social facilities; *medium density*, where there is a less marked dispersal of population and relative accessibility to social facilities; and *high density*, where there is a concentration of population and choices between several facilities are within easy reach.

With reference to population density it must be noted that there is both a lower and upper limit of acceptability. Lower density, in most cases, is a matter of practicality and prevailing community form, the limit of which is set by municipalities. The disadvantage of excessively low-density development may be summarized into three generalized categories.

First, overextension of an urbanized area which results in very large investments for roads, utilities and services in and adjacent to the extension area, very long travel distances from inner to open areas, and an increase of daily vehicle-miles roughly equal to the square of population increase.

Second, the intermediate "isolation" in the daily life of the individual and mass of people that is peculiar to an increase in the percentage ratio of travelling, the problems of bus service commuting and the fact that community facilities are difficult to maintain.

Third, the difficulty of finding labour for industry and commerce because many of the workers must travel long distances.

The upper limit of densities, or of densities that are too high, have been the main danger that planners have tried to prevent by prescription, mainly zoning regulations that call for minimum lot sizes, setbacks and yards, and maximum coverage and height or FSI. These prescriptions are fairly effective in setting an upper limit. The main disadvantage of high density is the whole problem of congestion, and over-use of available systems.

Population density controls have been traditionally associated with residential areas and are only now being extended to work areas, central business districts and industrial and commercial concentrations. In this extension of the concept, the number of people present in an area during peak periods of congregation becomes the criterion of density. Densities are shown in population per square feet or per acre, and their establishment is a major concern of land use planning. The densities are generally based on what is considered desirable in the public interest from the standpoint of public health and safety. Such measures must be reinforced by regulatory devices controlling the intensity of land use and the occupancy of structures in order to ensure that the designed capacity of the land is not exceeded. In this connection zoning and subdivision control are basic devices to accomplish these ends.

Population density control is aimed at solving some of the problems of congestion, thereby striking at the root of the traffic problem by preventing overconcentration, furnishing a sound basis for planning municipal services such as schools, sewers, and transportation lines, and providing the basic tools for organizing commercial and residential areas in more nearly self-contained neighbourhoods.

Daylighting of buildings and open space provisions are supplementary to density controls but no less vital for they are also aimed at increasing the amenity of city life and, correlated with density controls, the abolition of blighted areas.

Another purpose of density control is to protect the public facilities from excessive use. In view of the heavy demands put on such public facilities as water mains, sewers and streets, by commercial users, restrictions upon intensity of use are no less necessary in central business areas than in wholly residential areas. One of the devices adopted to control intensity of lot occupation is the minimum lot area restriction, which may vary with zoning classification. Another method is by the use of mathematical ratios between right-of-way areas for cars, car parking spaces, recreation and play areas, etc.

Table 9 — Daytime Population Densities

Community		Commercial		Industrial	
Population	CBD	General	Local	Heavy	Light
over 1 million	1000 plus	300 plus	150 plus	50 plus	100 plus
1/2 - 1 million	500	150	75	50	100
50,000 to 100,000	300	100	50	40	80
25,000 to 50,000	up to 200	up to 60	up to 30	up to 30	up to 50

Note: Daytime densities are in persons/net acre.

Source: HQ Town Planning, 1972

When determining the area for placement of federal buildings it is necessary, for the reasons already stated, to be aware of not only the existing population densities within the district, but also potential population densities and the capacities which can be handled adequately without negative effects.

Table 9 shows daytime population densities for certain non-residential areas.

Practical Interpretations

Check the zoning and subdivision regulations of the municipality for population density controls.

Determine the present and future population density of the area in order to measure the capacities which can be handled effectively.

Determine the prospective employee density and its impact on the rest of the population of the area.

Avoid over-extension of an urbanized area since this results in overly large investments for servicing.

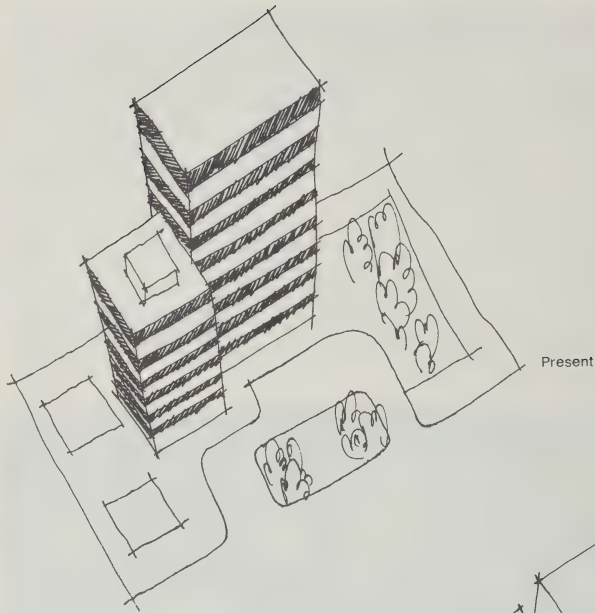
Avoid "isolation" of daily life since this necessitates an increase in percentage ratio of travelling.

Avoid over-concentration of an area since this results in problems of congestion and overuse of available systems.

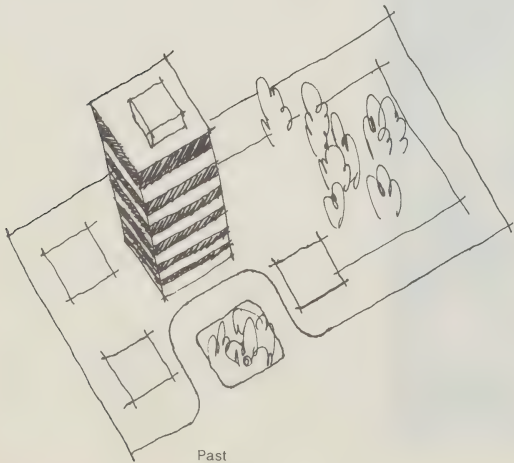


Functions change in unforeseen ways. Long-term growth may be certain, but its rate is not easy to manage or predict. Therefore, a high premium must be put on flexibility, on a physical shell that is easy to change or to add to, or on a good communications system which allows connections to be built up in any desired direction.

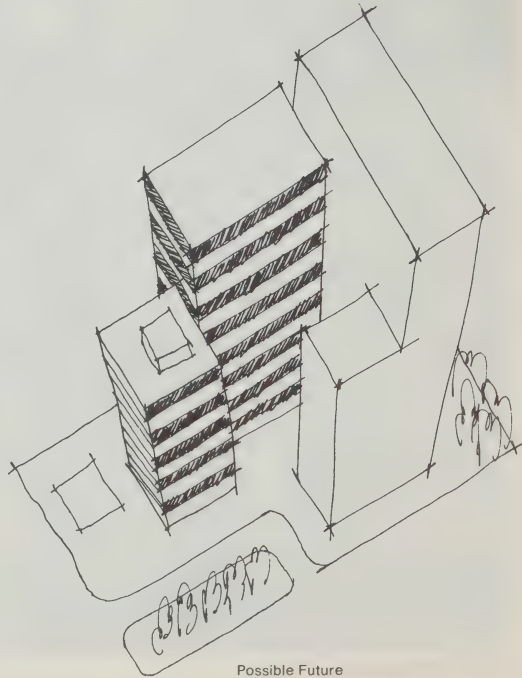
Longer-range growth is likely to be gauged by an estimate of the future growth of the base population. To these estimates of population change are applied ratios of public service employees and of space per person. These ratios are derived from past experience and are modified by speculation as to future change. Future requirements for land areas may then be computed from the floor space requirements by fixing a set of desired structural densities, or floor space indexes. These will of course vary from institution to institution. For example, in determining the future expansion potential of federal offices in a particular district there are two basic steps. First, establish the existing density characteristics. Second, draw on this information by using crude proportions relating space to the appropriate multiplier.



Present



Past



Possible Future



40 Future Expansion

A rough measure of the needed increase in aggregate floor space to be devoted to office use may be computed:

- proportional to the increase in employment expected during the planning period. Percentages are based on existing proportions, adjusted in the light of experience, to reflect observed trends or any planned modifications in these areas which may alter these trends;
- then, according to assumptions as to an average height of the building in which this aggregate floor space will be accommodated, estimates of the additional ground floor area which will be needed in all the federal offices of the particular area, during the planning period, are developed;
- next, according to locally adopted standards relating parking space to floor area, the amount of additional ground area in off-street parking required to accommodate the new office uses and to make up for deficiencies in off-street

parking for existing office uses, is estimated and added to the acreage; then cumulative totals are derived, and; these totals are adjusted upwards.

By this method a relative statement concerning the amount and direction of future expansion may be made.

In the case of Ottawa, forecasts of central area office employment were translated into office space requirements by applying floor space per employee ratios for federal and non-federal activities. These density estimates were then developed, based on analysis of existing densities, general trends in density in Ottawa and other cities, and specific research and design now being carried out on a continuing basis by the federal government, to substantially increase densities in federal space.

Federal offices, as has been illustrated, are subject to future expansion. Because this is an important consideration when planning a federal structure enough

flexibility should be incorporated into any development plan to allow for a certain amount of growth.

Practical Interpretations

Determine the present floor space requirements per employee (Treasury Board Standards).

Determine the probable short-range and long-range increases in employees.

Determine the amount of space required in the short and long-range period, either by the method of multiplication of floor space per employee and the probable increase in the number of employees, or some other acceptable method.

Convert from usable space to gross areas by applying appropriate accommodation factors for the type of building.

Allow for expansion in terms of square footage by allocating enough land to the site for necessary future expansion.

6. Site Utilization

GENERAL

It is important to understand the relationships between town planning and the various professional disciplines associated with architecture, engineering, realty management and landscaping — in the overall utilization (development) of a site. Indeed, each discipline encompasses a number of sub-disciplines. However, for the purposes of discussion in this chapter, it is necessary only to consider the broad fundamental relationships directly referring to land development. Details of functional land uses have already been discussed in Chapter 3. Consequently, their functions may be appropriately accommodated within the categories already mentioned and need not be repeated in any detail here.

Town planning considerations of site utilization include firstly the investigation of all the functions which may be located on the site. It should be compatible with overall land use concepts and inter-related zoning requirements. Not only site functions are included but also those generated by the project itself, e.g., traffic, loading, and consumer power, etc. — should be considered. The same town planning exercise would include the responsibility of providing advice, in general terms, on the parts and proportions of the site that could be selected for buildings, internal circulation, parking, etc. Accesses should also be designated by professional town planners to satisfy transportation needs.

Architecture is the discipline which develops the whole design concept; the shapes and forms, sizes which are necessary to satisfy internal functional and circulation requirements, and physical design needs, etc. It takes into consideration the town planner's advice regarding land use proportions and access locations.

Landscaping is devoted to the actual development of the site so as to support and enhance the architectural concept. This includes plans for site development, plants selected and planted, site furnishings — benches, and pavements, etc. — including site drainage and environmental coordination with the "flora and fauna".

Engineering is concerned with the locations for utility lines, water hydrants, soil and subsurface investigations including recommendations affecting the general characteristics of the site insofar as they influence the foundations, forms and size of the construction.

Realty Management makes decisions regarding the economic utilization of the site subject of costs, values and general investment security.

Not necessarily all of the above professions should participate in every site utilization program. Their individual participation is subject to the size and importance of the project, location and value of the site, etc.

Practical Interpretations

Ensure that professional disciplines are involved (where necessary) in deciding on site utilization.

Recommendations of the participating disciplines should be coordinated to eliminate possible controversies later.

Avoid situations in which any one of the above disciplines tends to dominate the decision-making process with its own requirements.

Invite other professional experts, e.g., environmental scientist, sociologist, economist, to help in dealing with large projects.

ORIENTATION

Only a part of the site's ground area is built upon. The location of a particular project within a site must therefore be determined by careful consideration of how to orient the "built upon" section of the land with the rest of the site where no structures will be erected. Once this decision has been made, list the preferences with regards to the direction in which the frontage of the structure should face. Consequently, the town planning recommendations should include both considerations:

- the orientation of the used part to the unused; and
- the orientation of the structure itself.

Town planning should claim only part of the decision-making process in terms of orientation. The architect-designer usually carries the prime responsibility for this. Nevertheless, town planners should bring out the coordination aspects in relation to the "cityscape", e.g., breaking the horizontal monotony of the building line, street elevations, the use of gradients, vistas and views, and shadow effects. Proper orientation towards areas where directional growth may take place, or sectors where visually pleasing future use functions are present or expected, are most important.

Practical Interpretations

Orient not only the elevation of the structures, but the "built upon" portion of the site as well.

Break up the monotony and designate the used and unused portion of the site with a proper orientation toward pleasing street frontals.

Building elevations should be oriented with regard to present and future activities.

Attractive views should not only be protected, but also appreciated by orienting "busy" frontages toward visual attractions.



The visual impressions of a structure are largely governed by volumes (masses), proportions, decorative elements, varieties in material and its relationship to open areas.

Most of the above characteristics are appropriately within the control of the architectural designer. The first and last characteristics, however, should also be considered from the overall town planning point of view.

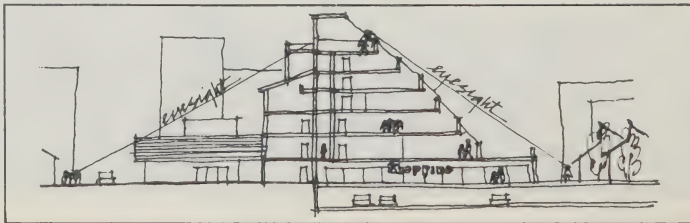
Most people understand that the interior furnishings and decorations of a living room or the colour combinations of a car or the clothing of acquaintances do have an influence on mood and behaviour in one degree or another. It is also true that the massing of structures in the urban environment and their corresponding interrelationships to open areas can have a great influence on our feelings, senses and subconscious behaviour. Some of these influences can create negative feelings in both the individual and the population in general. Insofar as the impact of the urban surroundings does have an influence on our inner thoughts, the causes and effects should not be neglected or ignored in the processes of site development.

Site space and volumes (masses) related to sites and general locations are not the same as the concepts and expression of architectural space. There is, however, a significant relationship insofar as the material handled by architects is further enriched and expanded if considered in conjunction with grounds, water, plants, trees, rocks, grassed areas, etc.

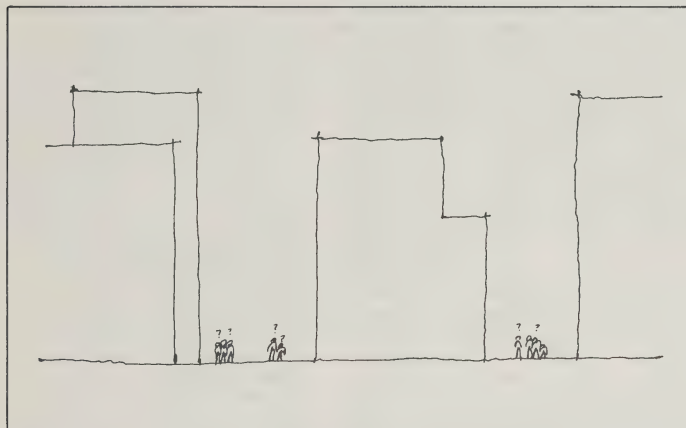
The cumulative effects of all these impressions together with their coordinated proportional relationships to the environment should be foreseen as a whole and considered by town planners.



42 Massing



Massing



Not this —

A great concentration of heavy masses may only be acceptable if planned together with open landscapes and unused areas. Narrow spacing between tall structures may even become desirable — for the purpose of humanizing the use of the space — if the masses of the structures are not long, unbroken wall faces but are eloquently decorated and enriched with details.

Masses of structures must be handled and organized in accordance with the way in which they are approached, entered, passed through and out through one exit or another. These masses will be appreciated together with visual impressions created by spaces both preceding and following their development. It is also necessary to emphasize the importance of the town planning approach where the massing of the structures is organized and coordinated with overall environmental concepts.

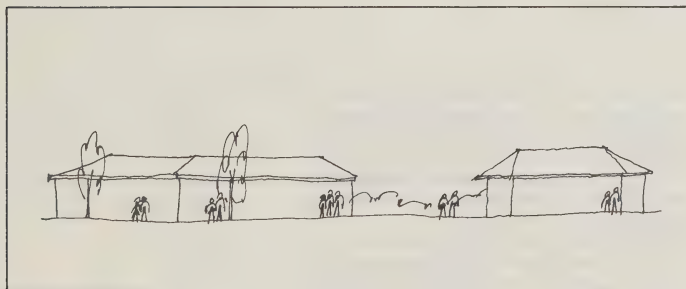
Practical Interpretations

In the massing of volumes observe the overall character of the environment, that is to say, not only the site itself.

Structural volumes must be organized into masses that are envisaged and interpreted not as a static element but by the humanized dynamics of movement — the comings and goings of people and of vehicular traffic.

There is an essential “blend in” of the transitional aspect for volumes that are massed in a continuity of visual impressions. In this respect, monotony should be avoided.

There is an occasional need to introduce an unexpected element in the concentration of masses; this, however, should offer a complete and justifiable attraction by itself and possess a special character and identity.



This — if possible —

The proper utilization of any site should be based on a conceptual design prescribing an overall development that includes present and future elements as well.

The actual design is certainly not a town planning aspect and limitation of the architect's freedom to formulate his own concept should be avoided.

However, the whole (present and future) program which is to be accommodated on a certain land parcel should be available to the town planner for his recommendations regarding site utilization. Reference has already been made to the same total program in the discussion of the site selection process (See Chapter 4) when the site's suitability and adequacy was examined. It will be discussed again in its entirety, to form the basis for the town planning concept regarding site utilization.

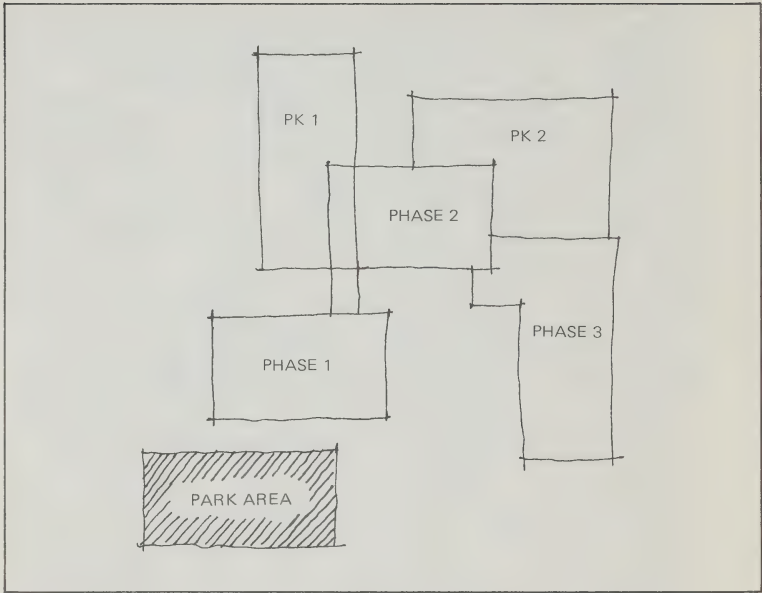
The conceptual design for town planning purposes helps to establish the:

- size and orientation of ground areas to be "built upon" (ground coverage);
- direction and ground area of future structural and site extensions;
- general location of parking, storage and service areas; and
- principles of internal circulation — the essential movements and routes related to pedestrians, vehicles and goods.

The conceptual design will recommend areas, in general terms only, for building locations without going into predetermined shapes and forms. Such a location in the plans is usually identified by means of a circle to indicate a general siting without a precise location.

The methodology of using overall conceptual design programs for forming a proper land utilization plan is basically the same for both large and small-scale projects and its principal steps may be highlighted in the following list of requirements:

- determine the complete accommodation requirements for the whole program (short and long range);
- learn about the phasing of the whole program;
- determine the number and the kind of structures to be erected on the site;
- learn about the number of storeys that are preferred for each structure;



Conceptual Design

- establish the approximate ground area required for all the structures to be erected;
- learn about internal relationship and functions between individual buildings;
- learn about locational and directional preferences for structures;
- locate all structures (present and future) on site showing general locations only;
- locate parking and service areas, internal roads, etc. in general terms; and
- check on open areas and ensure economic and aesthetic site utilization.

Practical Interpretations

Proper site utilization is based on a full program (present and future).

Locate all buildings, service and amenity areas on the site.

Show general locations only and indicate buildings by means of a circle (without determining size or shape).

ROAD SYSTEMS AND TYPES

The need for an adequate road system is, of course, a prime concern to every planner. It is a major element in any development scheme. As yet road systems are not in themselves a direct planning control — as is, for example, zoning — but their importance is such as to exercise a basic indirect control on the development of site construction.

A road system is a network of travelways used almost exclusively by powered vehicles. In the simplest classification system, highways and streets are grouped according to certain basic types, such as primary, secondary and tertiary road classes in rural areas; and as freeways, arterials, collectors and local road classes in urban areas. In addition, there are parkways, which may be in any one of the above classes. These classifications usually carry with them suggested minimum design standards, and are governed by the specific transportation services the system is intended to provide. Table 10 summarizes principal characteristics of the basic road categories.

Fundamentally, road systems are designed for a maximum speed and maximum flow capacity. The faster, safer, high-capacity road has fewer access points. This means that it provides best for long and stereotyped journeys, and it is crudely restricted. The efficiency of a road cannot be measured simply by the flow per lane or the journey time of those who use it. Moreover, any perceptible limitation affecting access to the road or system and the movements it prevents must also be taken into account.

So far as the various degrees of accommodation of through traffic and land access are concerned, the basic purpose of the urban and rural street system is similar.

In both cases the principal considerations for designating the roads into systems are the travel desires of the public, land access requirements based on existing and future land use and continuity of the total system.

A good system of roads is a prime necessity for any community without which it will exist, to a lesser or greater degree, in isolation.

Differing types of roads are required in different areas. Altogether, the various types of roads found in rural and urban areas make up the road system, or circulation route for that particular district.

Practical Interpretations

A federal development usually has a significant effect on the surrounding routes; consequently, the development should be located in accordance with requirements of the existing circulation system.

Officials responsible for locating federal functions in the urban milieu are expected to satisfy traffic needs by the same methods adopted by any other conscientious developer in the public or private sectors.

If large-scale federal functions are to be in an urban area a central location should be preferred so as to equalize accessibility from all directions.

Roads will function in direct relationship to the actual design criteria used and functional controls that are applied and these may not necessarily conform to the theoretical plans of designers. Ensure that approach routes to a major federal building will be controlled according to the new traffic volumes and functions generated by the federal project.

Table 10 — Roads' Principal Characteristics

Characteristics	Freeway	Arterial	Collector	Local
Movement	Primary	Primary	Equal	Secondary
Access	Limited	Secondary	Equal	Primary
Principal Trip	3 miles +	1 mile +	Less than	Less than
Length			1 mile	1/2 mile
Spacing	1-3 miles	1 mile	1/2 mile	—
Transit	Express	Regular	Regular	None
% of total system	0 - 8	20 - 35		65 - 80

Source: Traffic Engineering Handbook, ITE, 1965

The main *functions of roads* is to move traffic as effectively and economically as possible, with due emphasis on speed and safety. Considered in the simplest terms, it is a matter of handling four possible areas of conflict effectively:

- vehicles making left turns;
- cross traffic at intersections;
- loading and unloading of people and goods; and
- storage of vehicles at points of origin and destination.

Roads, the principal component of the circulation system of a city, are analagous to the heart and veins of the body. These life-lines are known as travelways. They consist of four *basic categories*:

- local streets;
- primary and local collector streets;
- arterials; and
- freeways.

Table 11 tabulates the most commonly used dimensions for the principal categories.

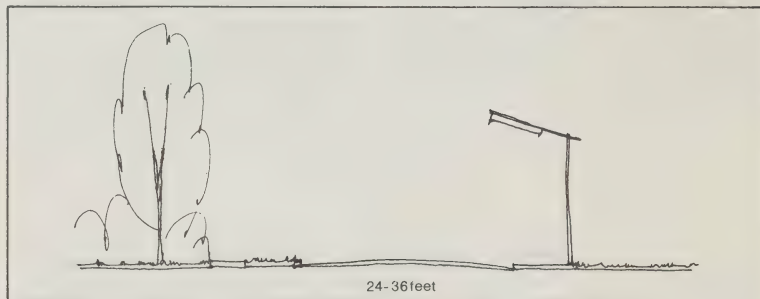
Table 11 — Right-of-Way (ROW) Standards

Type of Road	ROW (feet)	Width of Road (feet)
Local	50 - 80	24 - 36
Collector	66 - 100	36 - 62
Arterial	100 - 150+	48 - 72
Freeway	150+	72+ divided

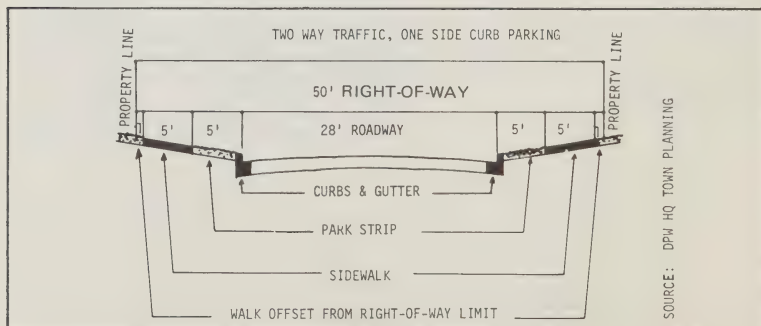
Source: Traffic Engineering Handbook, ITE, 1965

Each one of these categories fulfils a specific function and is molded to specific standards.

The *principal functions of local streets* are to provide access to property — both vehicular and pedestrian — and to move traffic. They also serve as easements for all types of utilities such as sewers, water-lines, etc., and as an open space between buildings to provide light and air as well as a fire break. The local street functions as an urban design element, such as site access for buildings and storage space for vehicles. Local streets must also conform to certain standards. In residential areas the common right-of-way widths between property lines vary between 50 and 66 feet, and the pavement width between 24 and 36 feet. In addition to these publicly-owned right-of-way areas, there are by-laws requiring off-street loading-unloading areas which could be public or private property. A typical road cross-section is shown in Figure 43.



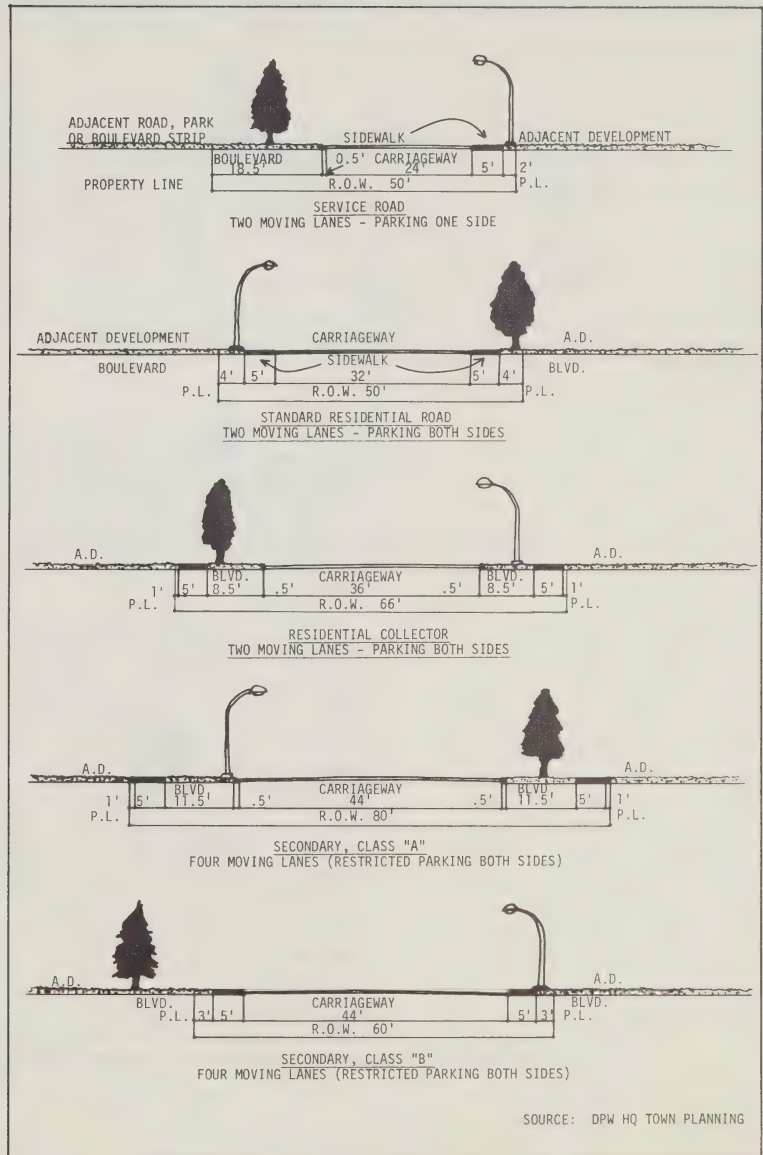
Local Street

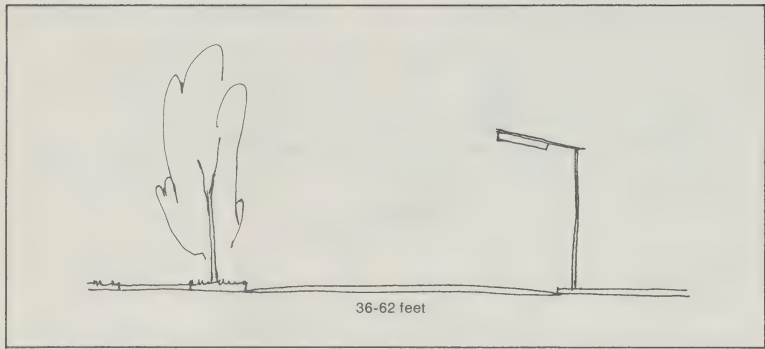


43 Typical Cross-Section of Minor Streets

The system design of local streets greatly affects traffic where unduly long streets build up traffic flow and volumes. The layout of local streets is intended to discourage and slow down through traffic. However, bringing too many local streets into an arterial route also creates unnecessary friction points thereby impeding the flow of traffic.

In commercial areas and industrial districts greater widths are necessary for local land service. The right-of-way widths vary between 66 and 80 feet depending on the type of parking, sidewalk widths and volume and turning movements of vehicles. Industrial areas usually have their own local streets. These are likely without sidewalks and with only limited street lights or none at all. Here the designer must consider the predominant type of trucking, parking requirements, curbing and setback of buildings. Turning and curb radii play a major role in design. Service roads adjacent to arterials should be a minimum of 50 feet in width. Typical section standards for local streets are shown in Figure 44.





Collector Street

- planting should be held back from the street; sidewalks should be separated from the pavement by a wide lawn or esplanade; and
- sight distances at intersections should be adequate and have no visual barriers adjacent to corners.

In addition, spacing between collectors should be partially controlled by factors affecting residential trip generation, such as car ownership, population density and the use of mass transportation. A spacing interval of a half mile between collectors is considered a general rule of thumb.

It is also necessary for collector streets to form a continuous system, since there may be a tendency for traffic to use the collector as an arterial, thus negating one of the basic principles of residential planning — to keep through traffic out. Typical section standards for collectors are shown in Figure 45.

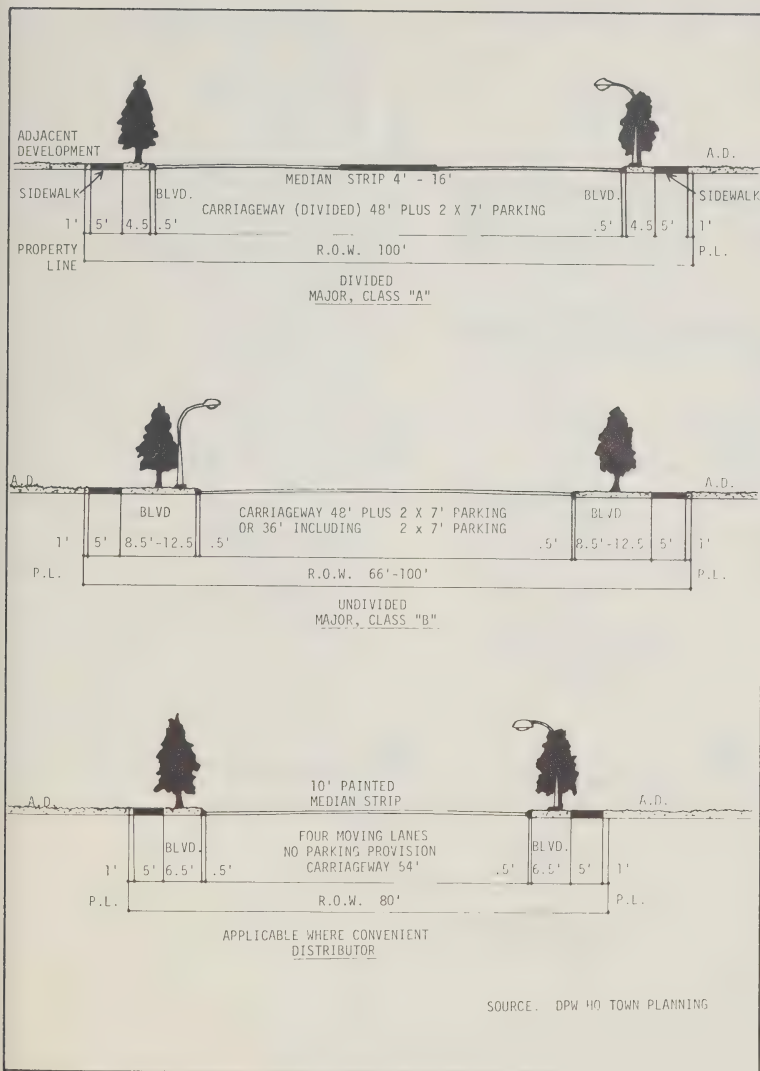
The main functions of *collector streets* are to gather traffic from local streets before their capacity is exceeded and conduct it to arterial routes. Land access is mostly a secondary function and so is the purpose of serving as an easement for utilities and open space. On-street vehicle storage is usually restricted during peak periods.

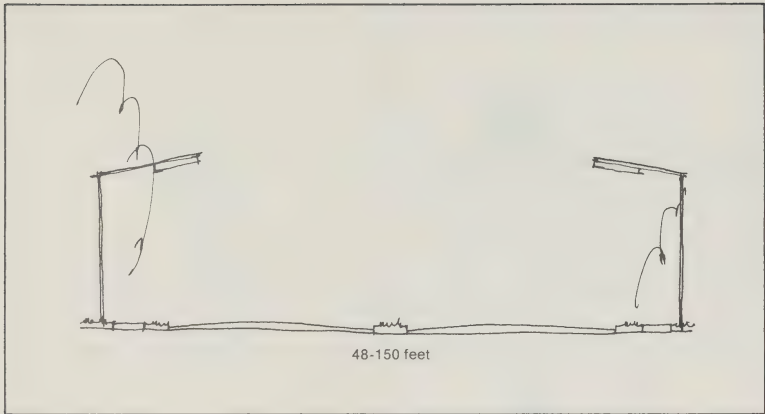
In large commercial centres, volumes build up too rapidly for the effective use of collectors. The local or land access street should, therefore, connect directly with an arterial. In large industrial areas collector streets may also be required.

There are specific standards which are used for collector streets. Parking is discouraged and residential buildings are not usually allowed to have driveways entering the collector and cannot have a cross-section less than the local streets entering it. The right-of-way widths vary between 66 and 100 feet, with pavement widths of 36 to 62 feet.

The design of collector streets is a most important factor in traffic safety, for example:

- local streets should preferably not cross the collector street directly;
- the "T" intersection is the most favourable, provided it is properly spaced;



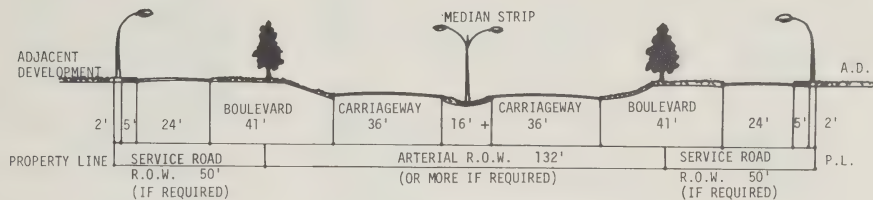


Arterial or Freeway

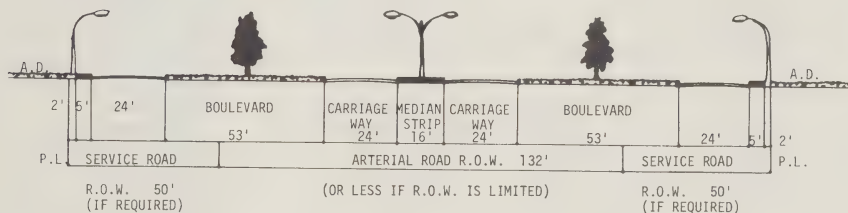
The main function of *arterials* is to move large volumes of vehicles, such as autos, trucks, and buses, at high speeds and for long distances. Basically, they are concerned with two incompatible functions, traffic service and land service, insofar as arterials are designed primarily for traffic under conditions in which land access is a secondary function. However, land access may be confined to individual parcels but could extend to service roads or accesses serving a group of properties with internal traffic distribution.

Certain standards have been drawn up with the object of ensuring that the specific purposes of arterials will be expressed in practice. Parking is controlled due to the pressure of increased traffic volumes. The right-of-way ranges from 100 feet up with a 48 foot to 150 feet or more pavement width often with median strips and service drives. New arterials have greater widths, with rights-of-way measuring 150-250 feet deep or more on the scale of a small freeway. As is the case with local and collector streets, arterials serve as easements for utilities, etc. Typical section standards for freeways and arterials are shown in Figure 46.

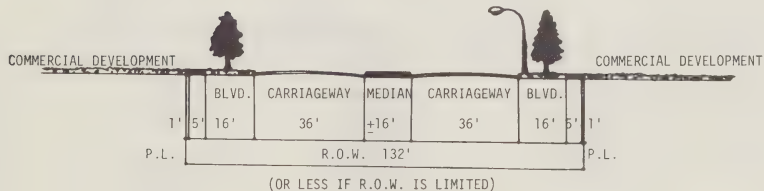
In essence, the system should be continuous with roads flowing through an urban area. To achieve this flow, spacing is important. It should be a function of density, one-half mile apart in older areas and one mile apart in suburban type densities. Lastly, street capacities are generally calculated in capacities per lane with 600-700 vehicles per hour per lane as the general rule of thumb.



FREEWAY
SIX MOVING LANES - NO PARKING PROVISION
(FOUR LANES ONLY IF R.O.W. IS LIMITED)
(ELEVATED OR DEPRESSED)



EXPRESSWAY
FOUR TO SIX MOVING LANES
NO PARKING PROVISION
(PARKWAY IF IT HAS SCENIC QUALITIES AND
NO SERVICE ROADS)



COMMERCIAL SERVICE ARTERIAL
FOUR MOVING LANES
TWO MANOEUVERING LANES

SOURCE: DPW HQ TOWN PLANNING

Freeways have only one function, to carry traffic. In this capacity they are highly efficient carriers. In most cases, they do, however, form a major barrier separating land uses on one side from those on the other. One type of freeway which is quite popular within city limits is the *parkway*. This is a freeway which excludes industrial traffic in favour of its use as a route by means of which people may enjoy the parkland as an essential element in the urban environment.

The standards for freeways are strict and very high. Accesses are controlled, parking, grade intersections and utilities are excluded and there is a physical separation from any adjacent development (elevation or depression). Capacities are calculated at 1,500 vehicles per lane per hour. Freeways are very expensive to construct. The construction costs vary from \$1 million per mile in rural areas to over \$20 million per mile in congested parts of the city.

Because roads perform such important functions, their standards should be high and carefully thought out. The maintenance of their functions is primarily dependent upon two aspects, design and control. Some important aspects of both are presented in Tables 12 and 13 for the reader's convenience.

Table 12 — Road Design Characteristics

	Freeway	Arterial	Collector	Local
Design speed	50 - 60 mph	30 - 50 mph	30 mph	25 mph
Pedestrian access	none, or separate	limited crosswalks	protected	yes
Property access	none	controlled	as required	yes
Crossings	separated	signalized at grade	controlled at grade	uncontrolled at grade
Connections	freeways, arterials	to all other except local	arterials and locals	collectors
Maximum gradients	3 - 5%	4 - 7%	5 - 7%	8%
Maximum degree of curve	3.5 - 7.6°	5 - 21°	6.9 21°	25°
Maximum super-elevation	.8%	0.6 - 0.8%	0.6%	none
Median strip	solid or depressed required	solid preferable	painted some	none
Sidewalk	none		one side separate	both sides monolithic

Table 13 — Road Controls

Design Control Features	Arterials	Expressway at Grade	Freeway	Parkway
Types of Vehicles	All	All	All	Passenger Cars only
Control of Access	Usually none	Full or partial	Full	Full or partial
Minor Cross Streets	At grade	Terminated	Terminated	Usually terminated
Major Cross Streets	At grade	Preferably separated, some at grade	All separated	At grade or separated
Control of lines and turning traffic at grade	Stop signs or traffic signals	Preferably stop signs-some traffic signals	All separated	Stop signs-traffic signals or separated
Private driveways connecting to through lanes	None or few	None or few	None	Restricted or none
Access connection treatment	Normal or flared	Channelized or Ramp Terminal	Ramp Terminal	Usually channelized or ramp treatment
Frontage roads or equivalent	Usually none	Where needed	Where needed	Usually not needed
Parallel curb parking	Restricted or eliminated where feasible	Eliminated	Eliminated	Eliminated
Shoulders	Seldom applicable	Included where necessary	Included where necessary	Included where necessary

Source: Traffic Engineering Handbook, ITE, 1965.

In addition, the use to which a road is put is also conditioned by the purposes of the persons who use it. In other words, if the area is not carefully surveyed and planned according to the purposes and needs of a community, a local street could easily be misused as an arterial, thereby resulting in various unnecessary problems. Briefly, these problems would amount to obstruction of the main function of moving traffic since the type of traffic using a certain road could be best identified by the speed at which it moves. Table 14 lists some information on design and rolling speeds on various roads. These could be a great assistance in observing the actual functioning of various roadways.

In determining the site for development, the federal government must, of necessity, consider the circulation system and identify the needs and the means to deal with them so as not to overload it. In this respect employment statistics and appropriate information about employees' journeys to and from work are required. Without an adequate circulation system the functional utility of a sizeable federal building could be greatly diminished.

Practical Interpretations

Determine the official classification of the roads abutting the development site by consulting the municipal offices.

Determine the functions and standards applicable to the classification, and ascertain whether or not each road does, in fact, conform to them.

If the capacities of the roads are in line with the standards, determine the excess traffic that will be occasioned as a result of the development and plan the accesses accordingly.

If the roads surrounding the development site are underclassified or overclassified, re-classify the roads and determine alternative circulation routes.

Remember that good accessible roads are a prime necessity for a development and often have a direct influence on its value and use.

Internal circulation routes are not regarded as functioning within any of the above categories and are to be designed as part of the site development exercise.

INTERSECTIONS AND INTERCHANGES

Intersections — affect the capacity on any one street. They are required to eliminate at grade the propensity for accidents at meeting roads. The actual volumes which necessitate construction are susceptible to argument, but it has been recommended that all crossings at grade be eliminated where the design volume on the road exceeds 3,000 v.p.h., or, alternatively, when the through-road volumes exceed 2,000 v.p.h. and the crossroad has 500 v.p.h. or more in the same hour (v.p.h. = vehicle/hour)

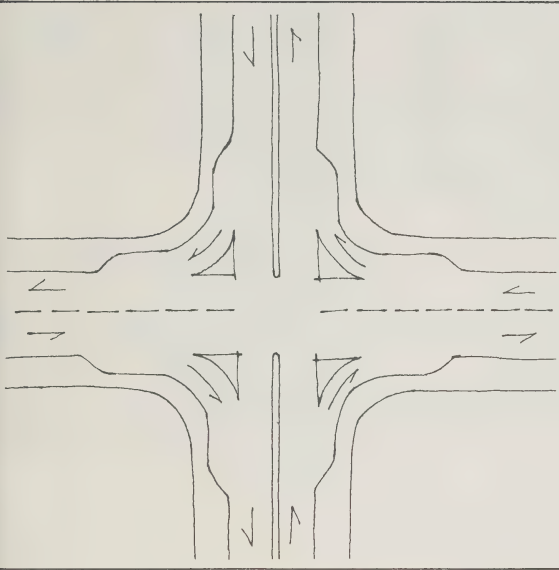
There are a number of at-grade intersections which are widely used. The most important of these are the channelized intersection, the rotary and the T-intersection.

The *channelized intersection* should be adequate for all anticipated turnings and crossings. The *rotary system* is mostly used when there are three or more intersecting roadways, either of them with higher classifications. The *T-intersection* is used to secure a traffic inflow and egress from and to a higher type of traffic way and an intersecting roadway, where no through traffic is provided for the lower type of roadway.

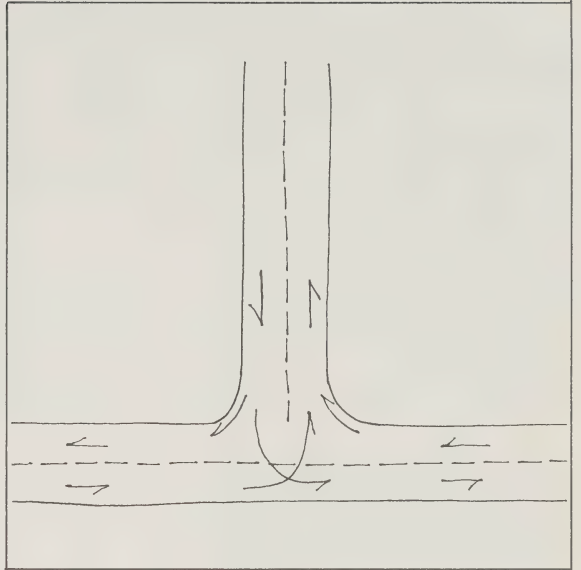
Table 14 — Rolling Speed on Roads

Type of Road	Design Speed	Rolling Speed	
		Free Flow	Peak Hours
Freeways	50-60	40-50	30-35
Expressways at grade	40-60	35-45	25-35
Major arterials	30-50	25-40	20-30
Collector	30	generally not critical	
Local	25	not critical	

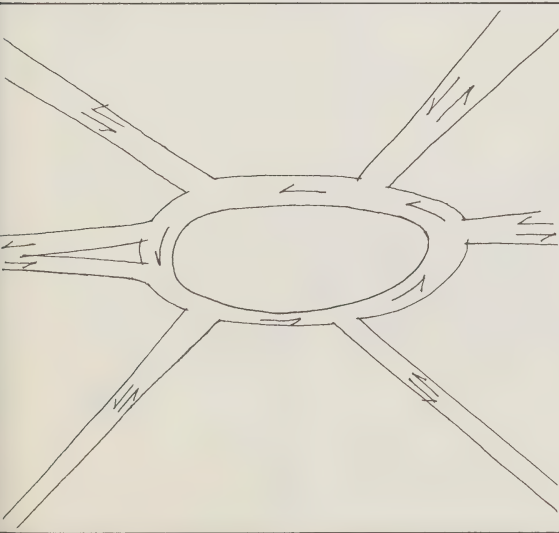
Source: Traffic Engineering Handbook, ITE, 1965.



Channelized



T-junction



Rotary

Table 15 — Intersection Designs

Slopes	0 - 8%	8 - 15%	15% +
Terrain Classification	ordinary	rolling	steep
Development Density	all densities	all densities	all densities
Approach Speed	25mph	25mph	20mph
Clear Sight Distance	90'	90'	70'
Vertical Alignment	flat	2%	4%
Minimum Angle of Intersection		75° - 90°	
Minimum Curb Radius			
local - local		20'	
local - collector		25'	
Minimum Centreline Offset of Next Intersections			
local - local		150'	
local - collector		150'	
collector - collector		200'	

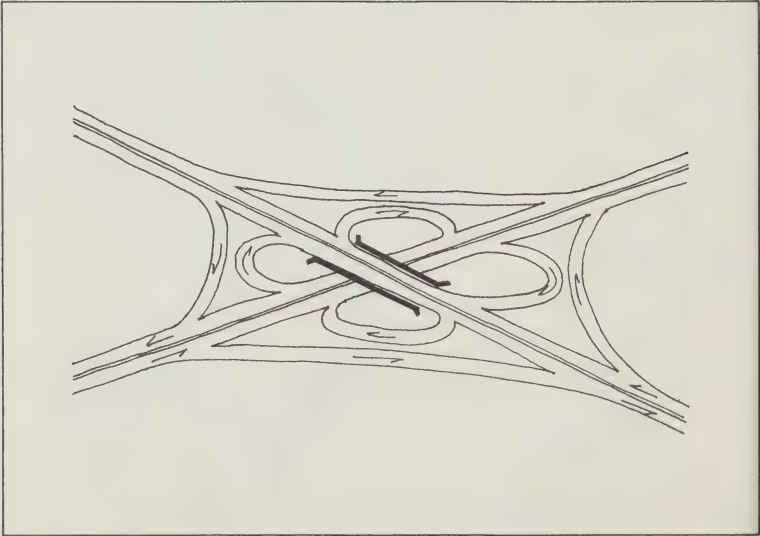
Source: Traffic Engineering, Jan. 1967.

The one important first principle to be noted about intersections is that a steep increase in danger points is directly related to the number of traffic streams and the volume of traffic which these streams actually accommodate per hour. Some of the basic design characteristics for various intersections are shown in Table 15.

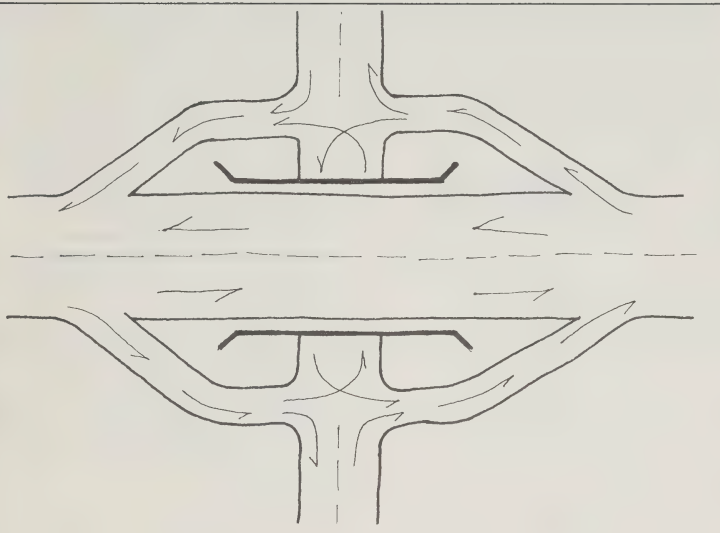
Interchanges — are more elaborate grade-separated systems that are employed to accommodate large flows of traffic and at the same time, avoiding any increased risk of collisions. There are four basic types of interchanges used to separate traffic at intersecting roadways:

- cloverleaf;
- diamond;
- directional; and
- multi-level.

The *cloverleaf* is normally used where traffic volumes are about equal and movement between roadways is sufficient to warrant separate loops. The *diamond* works best at major to minor crossings where left turn movements may be made on the minor roadway. The *directional interchange* provides for movements on separate roadways by using extra structures. Finally, the *multi-level interchange* is used for intersecting thoroughfares of major importance.



Cloverleaf



Diamond

This discussion on intersections and interchanges has been included in order to outline the importance of maintaining a somewhat free flow of traffic that is not plagued by collisions at certain points. Intersections usually succeed in this respect by the use of controlled signal lights, while interchanges perform the same function by being more elaborate in construction, thereby avoiding the signal light approach of stoppage at major routes.

Both are important as indirect controls in a more technical sense in terms of access to and from certain buildings. In other words, it is a case of poor planning to erect a structure inside a cloverleaf, for example, mainly because they are usually uni-directional. This type of construction would create a great access problem, especially so when the building holds a large number of employees. At certain times during the day this kind of cloverleaf usage would almost cease to function because of the rush-hour overload of traffic. For this reason care and consideration should be given to this matter so as to ensure that there is at all times an adequate flow of traffic and that access is not hampered.

Practical Interpretations

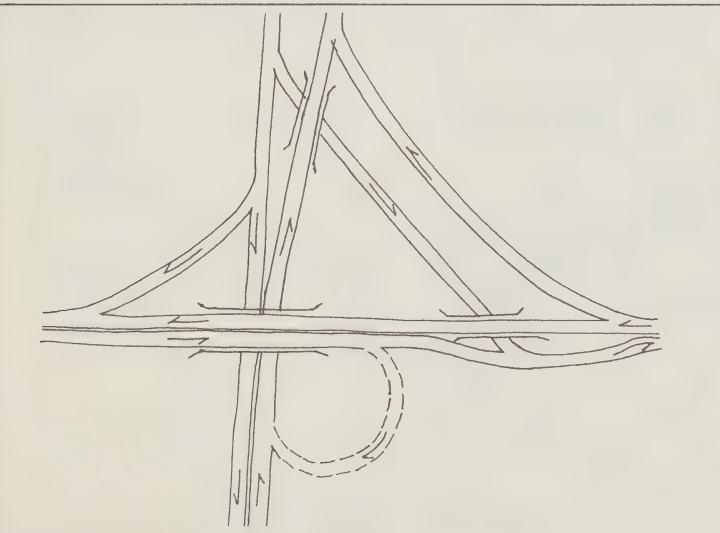
Determine the traffic volumes on the meeting roads and ascertain their official classifications.

According to the dictates of the traffic volumes and road classifications, determine whether an intersection or interchange is appropriate, and identify the type.

Intersections of more than two streets are to be avoided because they increase the risk of more potential collision points.

Ensure that no federal structures are erected within the limits of a traffic interchange.

Internal road layouts should be co-ordinated between town planners, architects and landscape designers.



Directional

ACCESS

An early step in land use analysis is the consideration of what activities should be linked with those already in existence and how close this overall access ought to be. Closeness of access is most accurately measured in terms of time and cost, rather than pure distance. This is not really a matter of how far a worker must go to his work, but how long it takes and how much it costs, as well as how many times he must change buses and/or subways, etc., in order to arrive at his destination.

Access is also a question of how adequate and convenient individual entrance and exit routes and parking facilities are in terms of time and distance. These should be considered together with building locations and entrances and as an extension of the layout of internal circulation systems.

Access then, is the prerequisite to the usefulness of any block of space. Without the ability to enter, leave and move within it, to receive and transmit information or goods, space is of no value, however vast or rich in resource. The more accessible, urbanized and developed a site becomes, the more the man-made features of use, structure, circulation, and utilities, tend to subordinate such factors as soil, topography and cover.

In determining the placement of federal government buildings, access should therefore be a prime consideration for without adequate access the structure's functional usefulness is greatly diminished. In this respect accessibility does exercise a very important indirect control on any development.

Considering individual site accesses on the other hand, it becomes essential to ensure that they are adequately provided for



Access is a "must" to every land parcel.

and appropriately situated outside the (overall) access points, and selected with due care to the requirements of:

- traffic flow (town planning — traffic responsibility);
- site development aspects (landscaping responsibility); and
- architectural design and entries to individual structures.

It cannot be stressed too strongly that all of the foregoing factors do directly affect the value of the land parcel and as such represent a primary concern for realty management.

Practical Interpretations

Determine the direction, volume and flow of traffic during certain normal and peak time periods of a day.

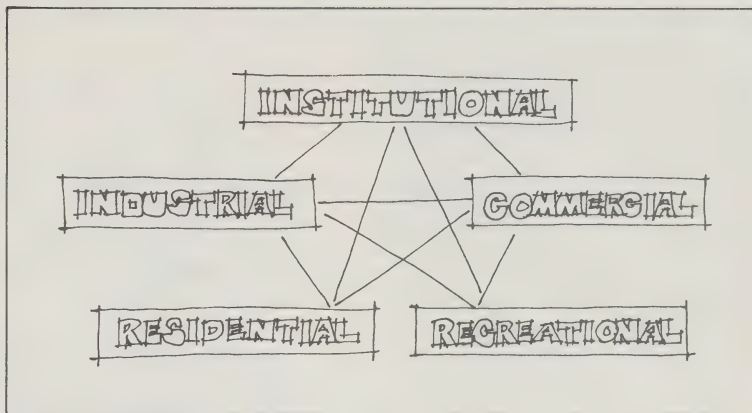
Assess the types of routes available to link the site to the circulation system, allowing for slow movement, stoppage and parking as well as manoeuvrability.

Take precautions to ensure an access route is not continuously overloaded and that passage is always possible.

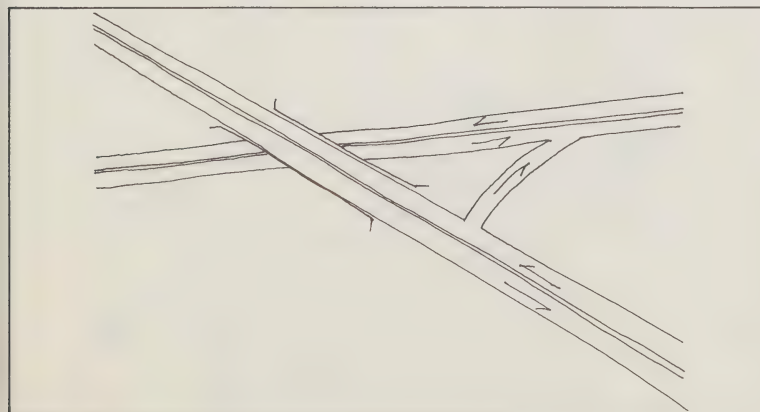
If necessary to allow for more than one access route.

Remember that access is a prerequisite to the usefulness of any block of space.

Coordinate location of site accesses with landscape and architectural designers.



System of linkages makes areas accessible.



Major roads may be directly connected.

The purpose of the pedestrian system is to link all major destinations, connect them to the rapid transit stations, reduce conflict with vehicular traffic, promote interaction in the compact centre and make pedestrian circulation efficient, safe and enjoyable.

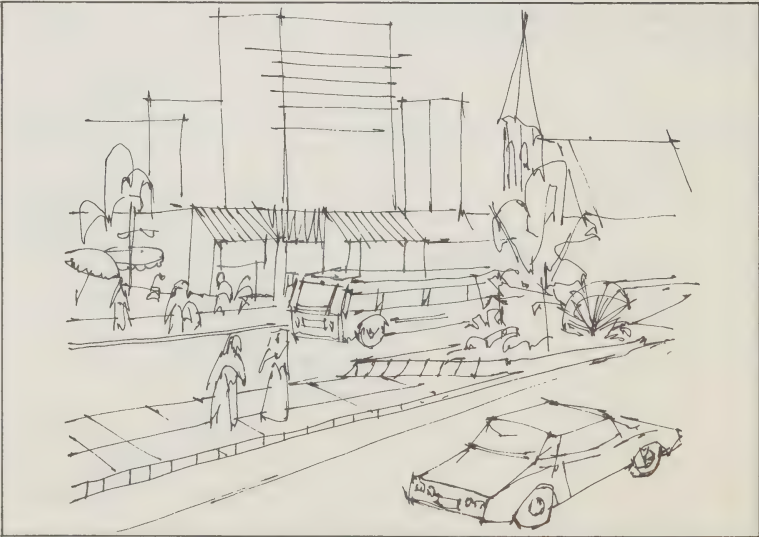
Much of the difficulty in cities arises because of neglect of the pedestrian. Pedestrian-vehicle conflicts are undergoing a marked increase, especially in urban areas. This is due partly to the great influx of people into cities and suburbs. Pedestrian actions are less predictable than those of drivers. Consequently, it is difficult to produce a definite design for orderly and safe pedestrian movement.

There are, of course, innumerable situations in which walking will always remain a prime mode of movement from point to point. Certain areas depend upon it almost entirely as a means of communication and intermovement; for example, campuses and shopping centres. The problem of conflict between pedestrian and traffic arises when automobiles prevent the free flow of pedestrians. It is impossible to have an ideal flow of both at the same time.

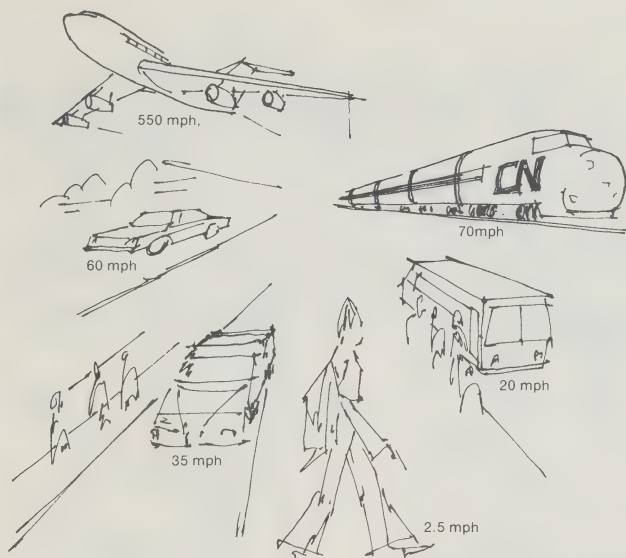
A good way to test the quality of pedestrian movement in a busy area is first to check the sidewalks to see if they are adequate, that width, paving, condition, protection from rain and hot sun, and sidewalk outfittings, such as benches, do meet normal requirements. Secondly, one should walk through a pedestrian area locating intersections and crosswalks, and determine whether the pedestrian is subjected to unduly long and annoying waiting periods. One answer to this is a combination of pedestrian safety islands and a reduction in the speed of traffic. Pedestrian crossings should be frequent and convenient. The ideal answer to the problem is the separation of cars and people either onto different levels, or the creation of pedestrian-oriented and separate vehicle-oriented zones.



Central city should accommodate pedestrians.



Pedestrians should be protected by provided islands.



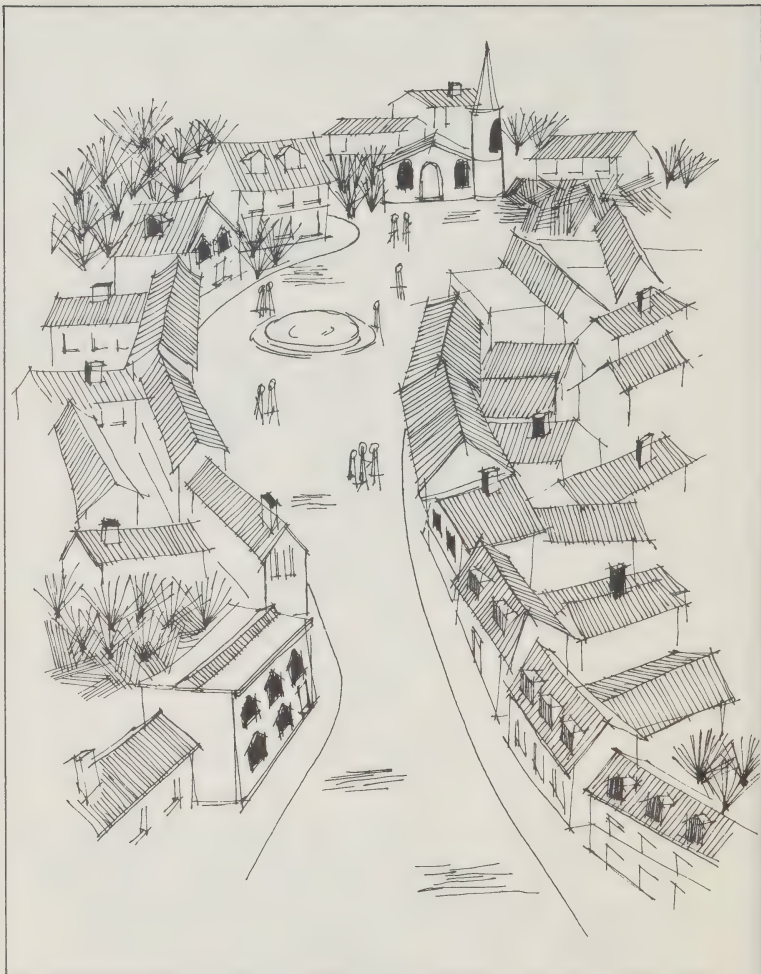
The major limitations on walking are distance and speed. Most people are willing to walk only about 500 feet from parking areas and walking speed averages only about two and one-half miles an hour. This scale determines the size of major groupings or hubs in a city and remains the basic enclave of urban design. As the length and width of these major hubs is seldom more than ten blocks and two blocks respectively, pedestrian malls have come very much to the fore, even more so since the goals of pedestrian malls are quite popular: to improve traffic circulation, to enhance the promotional capabilities of the district as a whole, and to enhance the aesthetic quality of the district.

Speeds of Circulation



47 Pedestrians

In essence, there should be a plan of pedestrian circulation within every city. Such a plan tends to knit the movement of the pedestrian into a city-wide network and connect with the major generators of pedestrian traffic. It serves as a guide to developers in the location of certain structures. The plan could, conceivably, be based on the Renaissance building principles of processional movement or the more casual movement sequences found in medieval towns. Squares and plazas not only assist pedestrian movement from place to place, but also provide a human scale for architectural monuments.



Mediaeval city — to be seen and comprehended at human scale.



Renaissance and late Baroque city — to be appreciated by pedestrians.

Since walking distance (e.g., from a parking lot, bus stop or subway) is so important to individuals who usually look for the shortest routes, placement of federal government structures should definitely take into account the suitability of existing and projected pedestrian routes.

Practical Interpretations

Check the existing quality of pedestrian movement by examining the sidewalks to see if they are adequate for the purpose in terms of paving, condition, protection from rain and hot sun and sidewalk out-fittings, such as benches.

Walking distances from parking areas should not exceed 500 feet.

Locate intersections and crosswalks, and determine whether the pedestrian is subjected to unduly long and annoying waiting periods. If so, arrange for pedestrian safety islands and a reduction in traffic speed.

Determine the routes of pedestrian movement and ensure that site developers will arrange paths according to these movements.

If traffic in the area is heavy and/or fast moving consider the separation of cars and people either on different levels, or the creation of pedestrian-oriented and separate vehicle-oriented zones, and suggest that the architect's design should support such a concept.

Study the following list of traffic improvements and provide for pedestrian safety and convenience. (Source: Traffic Planning and Other Considerations for Pedestrian Malls, Washington, ITE, 1966)

104 Minor pedestrian improvement with area modification:

- signal timing to favour pedestrians;
- midblock pedestrian crosswalks;
- parking and truck loading restrictions and enforcement;
- lighting and facade improvements;
- landscaping, including above-grade planters;
- litter baskets, news stands, phones and mail boxes;
- temperature controls, shelters and music;
- shuttle buses or similar services.

Pedestrian improvements requiring sidewalk widening:

- sidewalk widening at street crossings and bus stops with midblock;
- short-time loading or parking spaces;
- building setbacks or arcades;
- passageways to bisect long blocks;
- mini-parks on odd lots, courts and rear areas;
- benches, fountains, artwork and accessories;
- bus shelters;
- person conveyances including escalators; and moving sidewalks.

Pedestrian malls displacing vehicular traffic partially or totally:

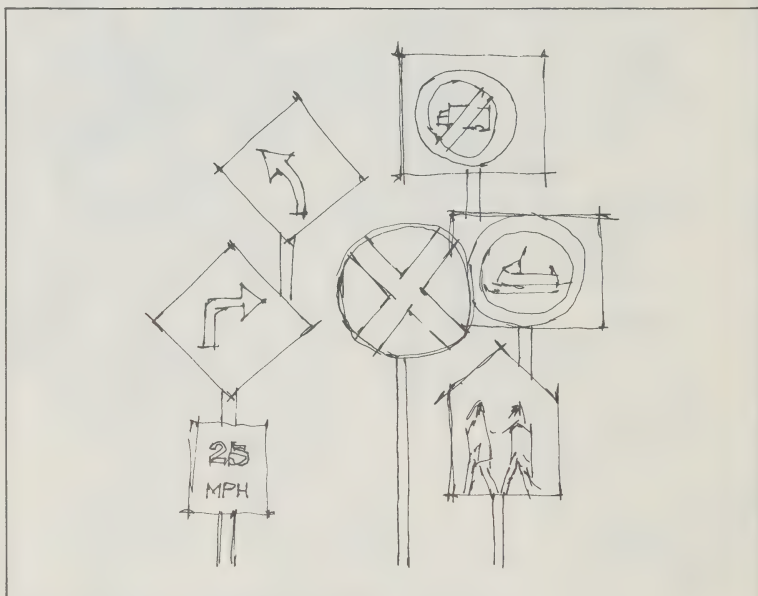
- transitway-exclusion of all vehicles except buses and emergency vehicles for which there are special lanes;
- plazas or interrupted malls — reserved for exclusive pedestrian use with cross street available to vehicular traffic;
- continuous mall — pedestrian street extending full length of area without interruption;
- excludes all but emergency vehicles.

Major pedestrian improvements with multi-level construction:

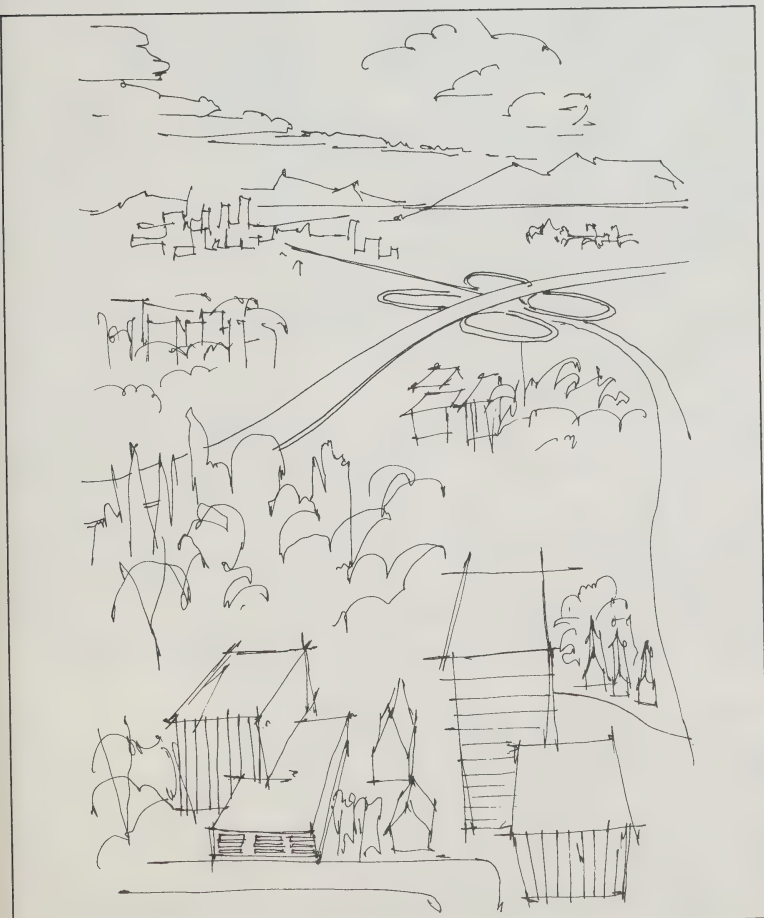
- separate pedestrian underpasses or overpasses across the main or side street;
- large second-level crossings combined with concourses above or below full intersection area;
- second-level pedestrian ways along the street;
- second vehicular level above or below the street for;
- either transit, autos or trucks.

VEHICULAR MOVEMENT

Rail rapid transit, buses, trucks and automobiles are all simply different types of vehicles, each with its own specific function and efficiency in the transportation of persons or cargo. Some are used more than others. The automobile for example, accounts for between 85 and 90 per cent of the total travel on roads while the truck accounts for most of the remaining travel.



The vehicle requires many directional devices.



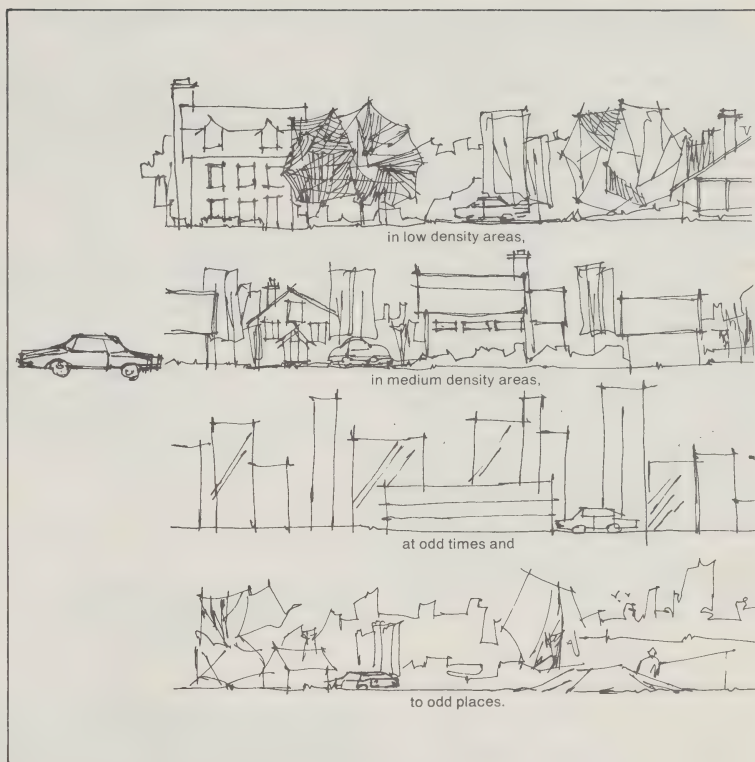
Vehicular movement creates a whole new world of scale.



One of the greatest problems of vehicular movement is that of rush-hour traffic in and out of the metropolitan core. Three fourths of the traffic movement in this area is unnecessary for the simple reason that the vehicle involved have neither origin nor destination in the central core; they are, for the most part, through traffic. They pass through because, more often than not, no by-pass exists. In this case, congestion is such that movement itself often ceases.

In determining an approach to vehicular movement, the federal government must therefore attempt to understand the underlying factors inherent in the movement itself. Thus, the facts of density, the different means of circulation for different densities, and knowledge of which of the various modes of transportation work best in different parts of the city, must be correlated and made compatible, one with the other, in order to plan development accordingly. For example, the private car is the best means of making trips in low-density areas. It also works best in medium-density areas, and is the most natural substitute for poor public transportation.

A *bus* or *streetcar* works well in a medium-density area where many people are going to the same place — work, for example. It also works well for feeder operations to a subway or rail terminal, for short trips from a medium to high-density area, and for short trips within a high-density core such as a city centre.



The private automobile is best for trips.

An *express bus* works well for long and medium trips in medium-density areas and for making trips from medium – and low-densities to downtown and within downtown.

Rail rapid transit is best for long trips from low – medium – density areas to the heart of a city, provided that access to stations is good. A commuter rail line may extend even farther out, in which event its stops must then be far apart.

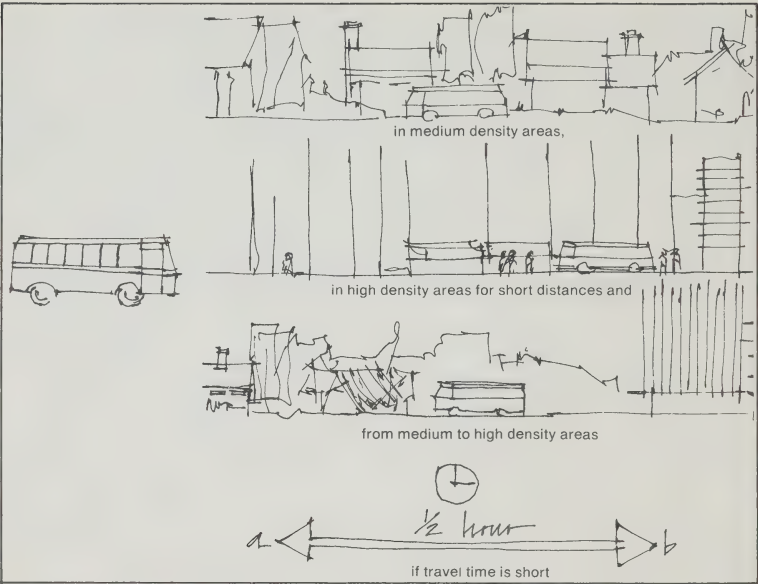
In essence then, driving is the best means of circulation for a myriad of special trips anywhere at different times of the day, in the absence of other convenient means, and until congestion or parking becomes an unacceptable inconvenience itself. Public transportation, on the other hand, works where there are concentrations of passengers in space and time.

In planning a federal development, it must be determined beforehand which of the vehicular movements are best suited to the employees in light of densities, physical and economic characteristics of the city, distance, time and cost. The structure should, therefore, be planned accordingly, instead of running counter to both trends and needs.

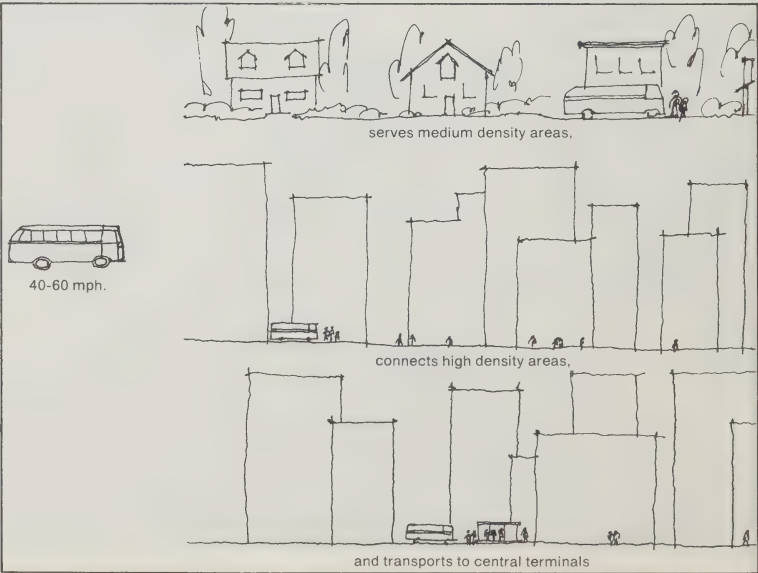
Practical Interpretations

Determine the existing traffic flows, pattern of movement and modes of transportation.

Determine the population density of the area in order to assess the type of circulation and the appropriate mode of transport.



The local bus is best for trips



Express bus

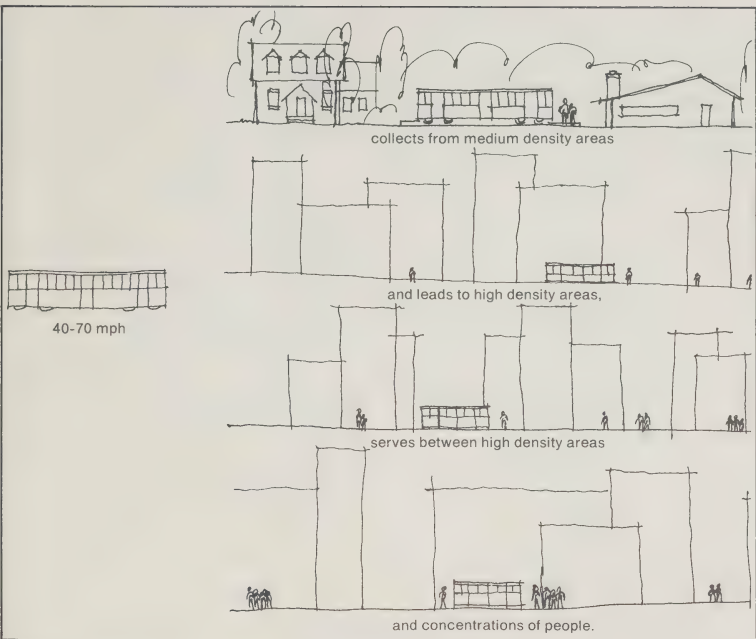
For example:

- automobile
 - long trips
 - low-density areas
 - medium-density areas
 - substitute for poor public transportation
- bus or street car
 - medium-density areas
 - feeder operations
 - short trips from medium to high density areas
 - short trips in high density areas
- rapid rail transit
 - long trips from high and medium-density areas

Determine the most suitable mode of transport and assess the necessity for a public transportation system.

In assessing the feasibility of a public transportation system determine the districts where the employees live, the existing circulation routes available, the distance and time factors involved, the alternatives and their consequences, and the cost of providing such a system.

Assess the needs for vehicle storage and meet it by public or private development.



Rapid transit



Plans for adequate loading and unloading facilities are a prerequisite to the establishment of a safe and efficient street transportation system. The inadequate supply of such facilities not only decreases the efficiency of the system, but can also seriously restrict the movement of vehicular and pedestrian traffic.

Curb loading and unloading zones for passenger cars are generally a necessary provision in congested sections for urban areas.

Of even greater importance are adequate facilities for commercial vehicles. However, curb loading zones are only practical solutions to the problem of truck loading demands, for example, in busy commercial districts. The use of alleys, where available, often serves to supplement truck loading space.

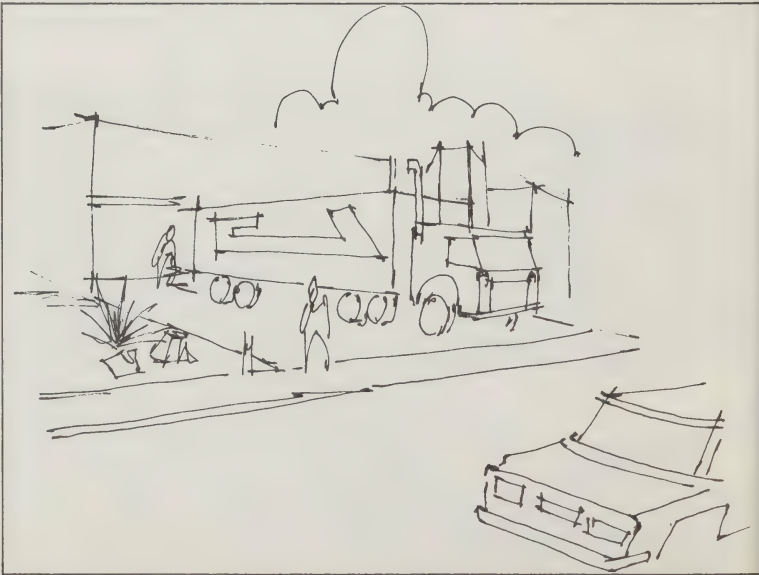
Before making a decision to establish curb loading zones, the degree of need should be defined and evaluated through a study of current practice. Such a study can be made on an individual block basis.

However, it is desirable to examine interrelated areas as a unit. A study of this type is essentially an evaluation of space, supply and loading demand.

A zoning by-law is desirable to create an official uniform procedure for establishing commercial loading zones. It should provide the method of designation, the use and discontinuance of such zones, and the penalties for violation. Among other things the by-law may specify that there will be: no alley or off-street space for loading use; no curb loading space within 100 feet of proposed zone without crossing a street or alley, except in areas of concentrated activity; a minimum of 10-15 stops per day (for pick up and/or, delivery) per business or combination of business proposed to use the zone; and the weight, quantity and time requirements of loads handled.



Bus loading zones should be inset.



Off-street loading permits traffic flow.

It must be understood, of course, that there is a wide variation from city to city and place to place in the capacity of loading facilities required, and these will also have to be equated in relation to the floor area of buildings. In planning a federal building, therefore, all these aspects should be taken into consideration.

Practical Interpretations

Examine the need for loading or unloading facilities through a study of current practice, including an evaluation of existing space and the supply and demand for loading.

Allow for curb loading and unloading zones for passenger cars as well as for commercial vehicles.

Avoid curb loading and unloading as much as possible, especially on small streets and in busy areas of the city because of possible congestion.

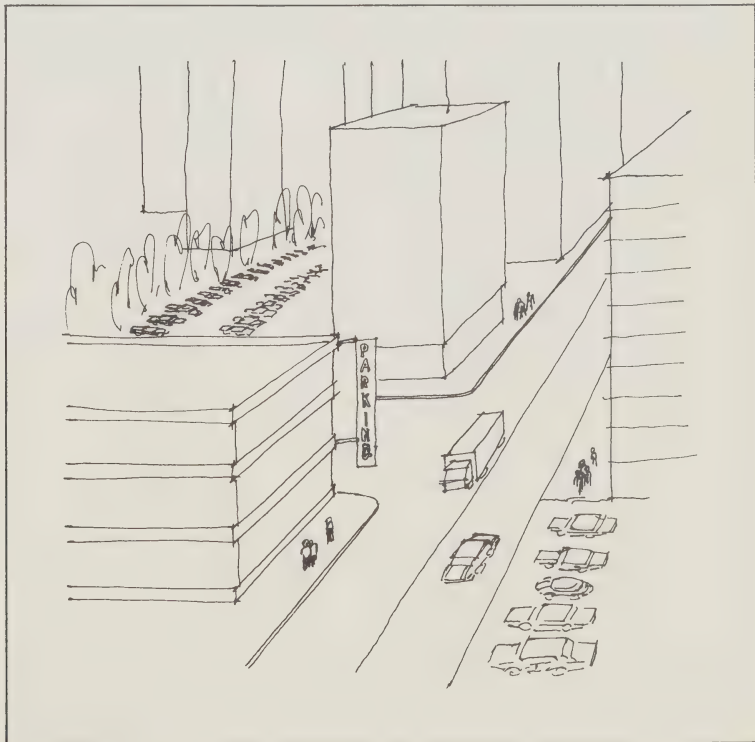
If the development is situated in a busy district, such as a commercial area, allow for the use of alleys and/or driveways.

PARKING

Parking is an integral part of the automotive transportation system. It is the terminal storage for vehicles while drivers and passengers are occupied elsewhere. One objective of a good transportation plan is to provide a balance between circulation of motor vehicles and terminal storage.

The amount of parking space required has long been a subject of discussion. The Urban Land Institute of America has established an index of 5.5 parking spaces per 1000 square feet of gross leasable area, which may be either on-street or off-street. (each 9' X 20') Other standards, may go as high as 6.5 units per 1000 sq. ft. (each 8' X 19').

These however, do not include aisles and approaches. It will be further detailed in the following tables that area requirement for each parking car including aisles and approaches would average to some 350 sq. ft. (see Table 16). As an approximate quick calculation one acre of land used for surface parking would accommodate an average of 120 cars including all approaches.



The auto requires new forms of storage.

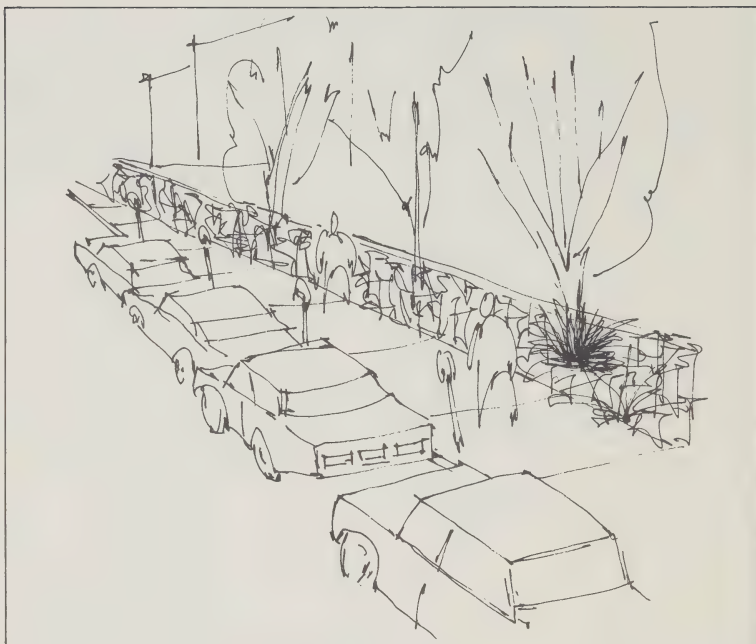
On-street, or *curb parking* presently comprises 14 per cent of the total space supply in urban areas of one million and over, although it accommodates over 50 per cent of the total parking demand. Still, curb parking space is inadequate to accommodate peak demands. The use of parking meters, either manual or automatic, is the most common method of reducing the average curb parking period. They are an assurance of availability, that a particular spot will not be occupied by all-day parkers. Although parking meters improve traffic flow the method of curbside parking is in itself not very acceptable as it is a high contributor to traffic accidents. Further details and characteristics of curb parking will be offered later in this chapter.

The second method of parking is *off-street*, in specified parking lots or garages. An important factor in their location is the walking distance from the parking facility to the driver's destination.

Another factor in location is land cost and construction cost. Construction costs alone range from \$1,500 to \$3,000 per space for conventional ramp garages, \$2,000 to \$4,000 for mechanical garages and an average of \$4,500, or more, per space for underground garages. Often, therefore, the deciding factor of what type of parking facility will be erected is land cost. For example, for land values below \$5 per square foot, surface parking lots are generally more economical than garages. Between \$5 and \$24, multi-deck garages appear more feasible, while for unusually high land costs, underground garages may be commonly acceptable. In addition, the foregoing considerations should be further made subject of the costs of servicing the land with urban conveniences. The use of serviced land for surface parking purposes should always be carefully scrutinized.

In addition to land and construction costs, the location of a new parking facility should also depend upon the:

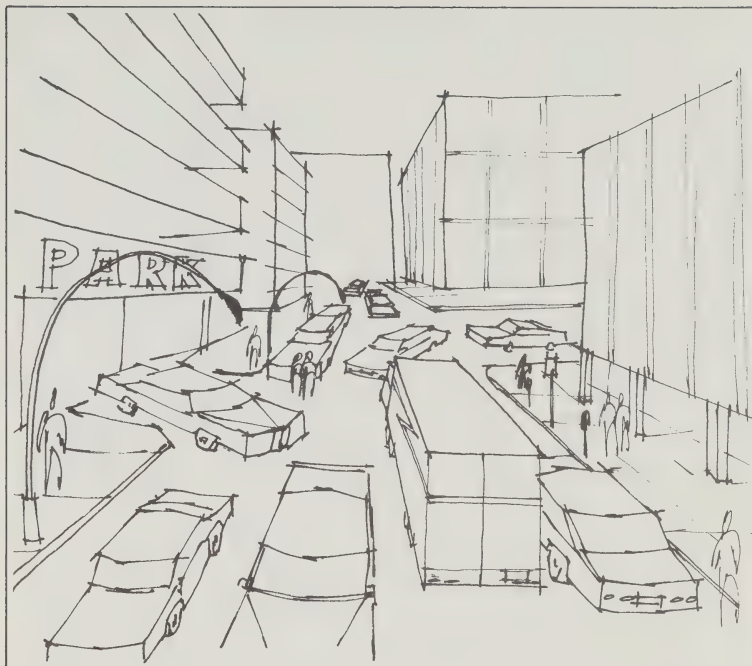
- degree of demand within a specific area;
- location of traffic generators;
- adequacy of existing parking facilities;
- geographical area within which the demand exceeds supply; and
- location of suitable access streets.



Curbside parking takes up road space.

As well, there are certain design criteria which must be followed. Parking space layouts depend to a great extent on the size and shape of the areas available for this use. Angled parking spaces are easier to get into but present a disadvantage when backing out. Perpendicular stall widths in this case should be 9 feet where room is available and certainly not less than 8 feet. Stall separators painted with a double line a foot apart are preferred to a single line stall separator, space permitting. On the other hand, if cars are parked at an angle of 90 degrees to the access road, stall depth should be 19 feet minimum and aisle width 23-25 feet, while corresponding widths vary from 9' to 8'. For 45-degree angle parking stall widths must be at least 12.5 feet.

Table 16 and Figure 50 show parking area dimensions incorporated in most of the North American Standards.



Parking within CBD may cause havoc.

Table 16 — Parking Area Dimensions

Width of Stall	Angle of Parking Deg.	Direction of Parking	Width of Aisle Ft.	Depth Perpendicular to Aisle	Width Parallel to Aisle Ft.	Unit Parking Depth Ft.	Unit Parking Car Ft.	Area Per Car Sq. Ft.
8.0	30	Drive in	12.5	15.1	16.0	27.6	42.7	341.6
	45		12.5	18.0	11.3	30.5	48.5	274.4
	60		21.0	19.7	9.2	40.7	60.4	278.4
	90		25.0	19.0	8.0	44.0	63.0	252.0
8.5	30		12.5	15.1	17.0	27.6	42.7	363.0
	45		12.5	18.0	12.0	30.5	48.5	292.0
	60		20.0	19.7	9.8	39.7	59.4	292.0
	90		24.0	19.0	8.5	43.0	62.0	273.5
9.0	30		12.5	15.1	18.0	27.6	42.7	384.3
	45		12.5	18.0	12.7	30.5	48.5	308.0
	60		19.0	19.7	10.4	38.7	58.4	303.7
	90		23.0	19.0	9.0	42.0	61.0	274.5

Source: Traffic Engineering Handbook, ITE, 1965.

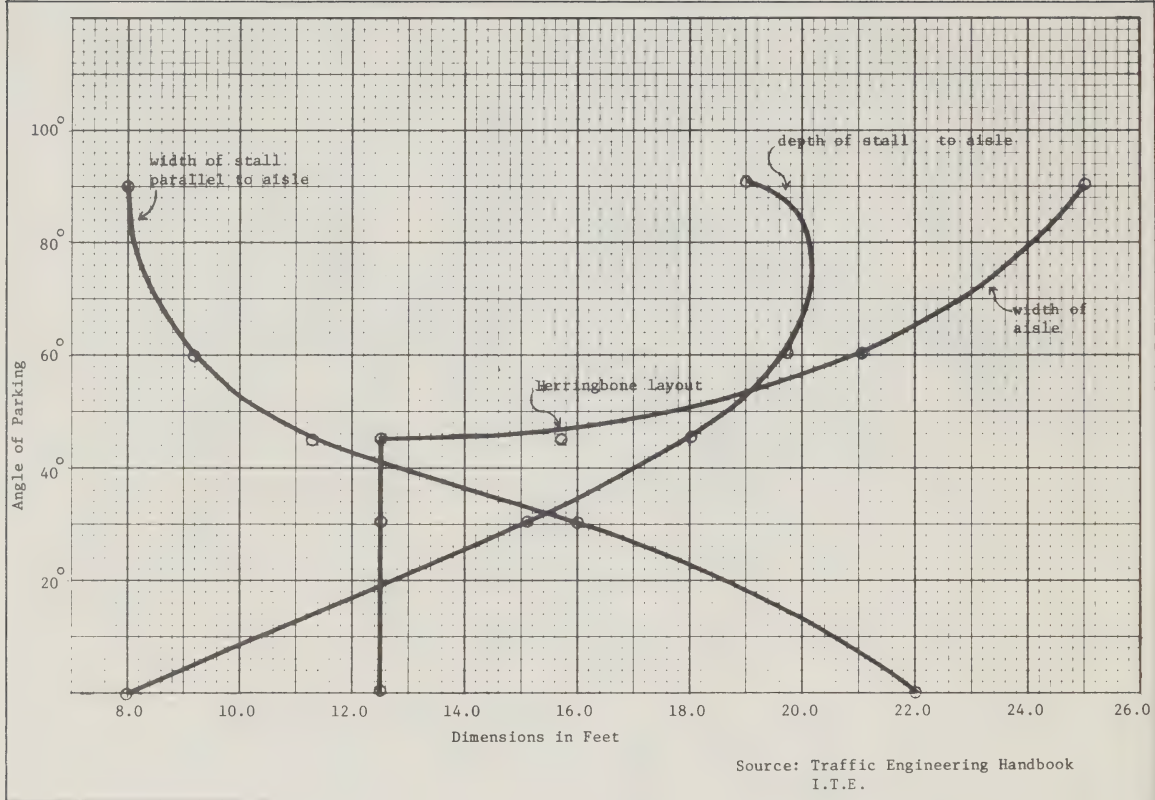


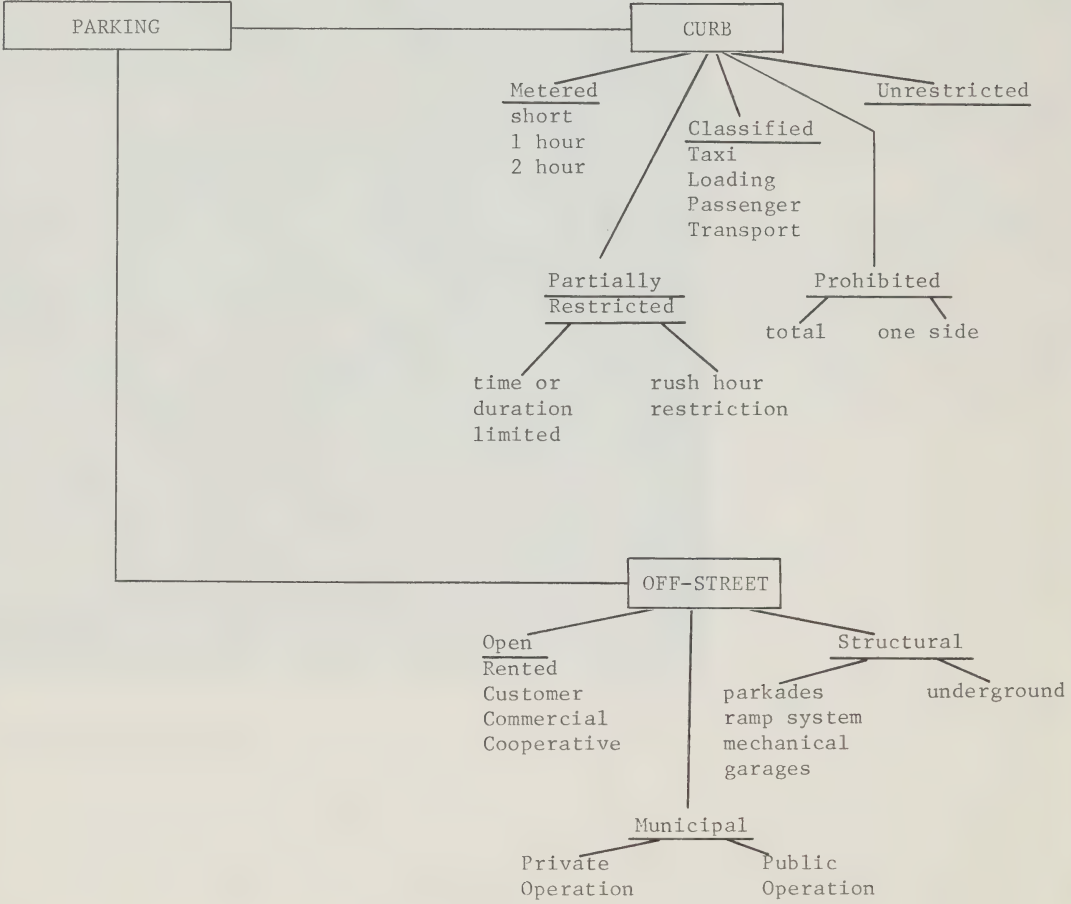
Figure 50 may be used to assist interpolation whenever unusual circumstances are encountered.

Since parking needs have developed wherever people congregate, parking has become a major urban land use requirement. It is an essential requirement in the design and location of major buildings and activity centres and usually a prerequisite to their development. To obtain maximum benefit from the use of projected parking space, parking facilities that may already be in existence adjacent to the site should also be evaluated.

Inadequate parking precipitates illegal use of curbs and, in turn, can adversely affect the entire central area traffic circulation. For these and other reasons, it is to the advantage of federal government projects that a careful study be made of the parking requirements for any proposed structure, where many of the more unnecessary problems associated with parking may be avoided by careful planning.



51 Parking



Source: DPW Town Planning 1972

For easy references and understanding of the technical terms used with regard to various parking functions, see Figure 52.

Short explanations pertinent to the use and principal functions of the categories illustrated in Figure 52 are shown hereunder:

Curb parking — is provided on the roadway along its sides and use is controlled by signs erected by the municipality.

Metered — this includes all parking areas where the duration of parking is controlled by a timing device.

Partially restricted — means that parking is prohibited during certain peak periods.

Classified restrictions — reserve that use for certain vehicles only (taxi, transport, deliveries, etc.).

Prohibited — no parking at any time.

Criteria for using curb parking are to:

- ensure clean vision near intersections (min. 20');;
- eliminate interference with intersections, driveways, pedestrians, etc.;
- ensure access to hydrants and other utilities; and
- free the carriageway for traffic whenever required.

Priorities in using curb parking are applied in the following order:

- traffic;
- loading;
- passenger;
- short-time parking;
- long-time parking.

Off-street parking — should always be preferred to curb parking wherever possible. It is provided in specially designated areas, but clear of the carriageway itself.

Open parking areas — are at grade surface and could be rented or assigned to groups or individuals.

Municipal parking — is offered to the public from municipal ownership:

- directly and retained under municipal administration or
- rented to private operators.

Structural parking — is usually provided in high density areas below ground or in special structures where at grade use for parking would be too expensive.

General Comments Concerning Off-street Parking: 117

- Most economic is 90° for rectangular lots (most cases)
- For lots 120° in width 60° parking is most economical
- Back-in parking presents traffic hazards but require less area
- Access width at grade single entry . . . 16'
- single exit 10'
- combined entry & exit (min.) 26'
- structural entry of exit (min.) 12'
- ramps (min.) 14'
- curved ramps (min.) 14'
- turning radii outside 30'
- inside 16'
- ramp grades (max.) 15%

Practical Interpretations

The physical layout for parking is an engineering exercise, its development belongs to landscaping, and its relationship to the building is part of the architect's site plan. However, the general utilization of the land area for parking, its influence on internal circulation and accesses to the adjacent areas and roads, come within the scope of the town planner's authority. Sites should be selected with due regard to the size and location of parking areas. Land use and accesses should be handled as part of the town planning input.

The building's parking areas should not be separated from the building by any roads used by motor vehicles.

Parking areas should be within 500' walking distance of the building they serve.

Serviced land may only be used for surface parking if other means of parking are less economical.

118 **AIR-RAIL-SHIP TRANSPORTATION**

Federal structures occasionally require direct air-rail-ship connections for transporting goods. Obvious examples are: postal stations distributing parcel and bulk mail; national customs installations dealing with foreign shipments; and grain handling, storage and loading facilities.

The actual design of the necessary transportation connections does not come within the sphere of influence of the town planner. Nevertheless, certain requirements must be formulated prior to the beginning of the site selection process. The following considerations are important:

- a direct connection with the transportation facilities;

- the acceptable distance (if any) which may be tolerable;
- the possibility of extending the transportation connections and/or;
- the additional costs of operation if locating away from these connections.

Each of the foregoing should be carefully investigated according to the circumstances.

Such connections are not convenience items for federal facilities, but cost items if alternative modes of transportation are to be installed. These requirements need careful and early analysis during the program development stage.

Practical Interpretations

Investigate the possible need for direct air, rail or ship connections.

Assess the economy of providing for such connections directly or by using other means of transportation.

Coordinate with authorities in control of such facilities to learn about their requirements.

Ensure that the requirements of transportation authorities are observed during the design and construction stage.



UTILITIES

The servicing of land parcels is an engineering responsibility. Town planners, however, should have a fair understanding of the principles, techniques and especially the costs of utilities servicing. Town planning decisions regarding locations and land utilization would certainly influence the engineering aspects of the layout and capacities of utility lines.

It is not necessary here to discuss in detail the technical requirements relating to land servicing but to offer a few useful and representative highlights so as to emphasize the need and importance of good co-ordination with the service engineers.

The major service connections needed to develop a land parcel are:

- sanitary sewers;
- domestic water;
- storm sewers; and
- electrical power.

In addition to such principal services, there are a number of other utilities, public services for example, all of which are necessary to the proper functioning of a development.

Roads are also an essential part of the services as already indicated in the preceding chapter. *Appendix 2 Checklists* should also be consulted.

The important aspects of servicing i.e., those which are relevant to the town planning considerations concerned with the siting of government structures, are highlighted in the following part of this discussion.

Sanitary sewer — usually a separate system for the disposal of waste leading to treatment facilities. In an older type of development, however, it could be combined with the storm drainage system, thus serving both purposes in common pipes. Quite often, the treatment facilities are non-existent and sewage is discharged directly into lakes and rivers.

The provision of a suitable line with adequate capacity is the responsibility of the city. If, however, the federal development substantially overloads the municipal system, a federal contribution to the extension of the sewer lines could be requested. It should be noted that such a provision is entirely the developer's responsibility:

- within the property itself;
- in unserviced areas; and
- in case of special or oversized areas.

Any large scale federal development should be connected to a sewerage system with adequate treatment facilities. No federal structure should operate by discharging untreated waste in any location of the country.

The most important characteristic of a sewerage system is that it operates on the principle of gravity flow. A minimum slope of 0.5 per cent is required for lateral pipes. Main trunk lines are not to be tapped for individual connections. Pipes are to be lowered to a minimum of a six-foot depth to facilitate frost free service.

120 In place of sewers, septic tanks or open disposal lagoons could also be acceptable in unserviced areas. Septic tanks, however, should only be used by small users.

Utility lines should not be built over, but road and sidewalk pavement or parking areas may be constructed over sewer lines.

For general design calculations, an average of 100-gallon waste per person per 24 hours may be expected. Office population may be counted for less than half of the above load.

Minimum pipe size for federal construction is 8". Laterals should not exceed 50' horizontal length. Minimum velocity in pipes should exceed 2 feet per second for self-cleansing effect.

Water — unlike the sewer pipes, the water distribution system works on pressure and the layout of pipes requires no sloping. The system should nevertheless, be buried under a minimum of 6' earth to keep it frostfree.

Dead-end lines are to be avoided, and the layout should support a circulatory ring system to avoid problems of:

- flushing and cleaning;
- pressure losses; and
- breakdown in service.

Valves should be installed maximum every 1000' and water hydrants should be less than 500' apart.

Water hydrants should:

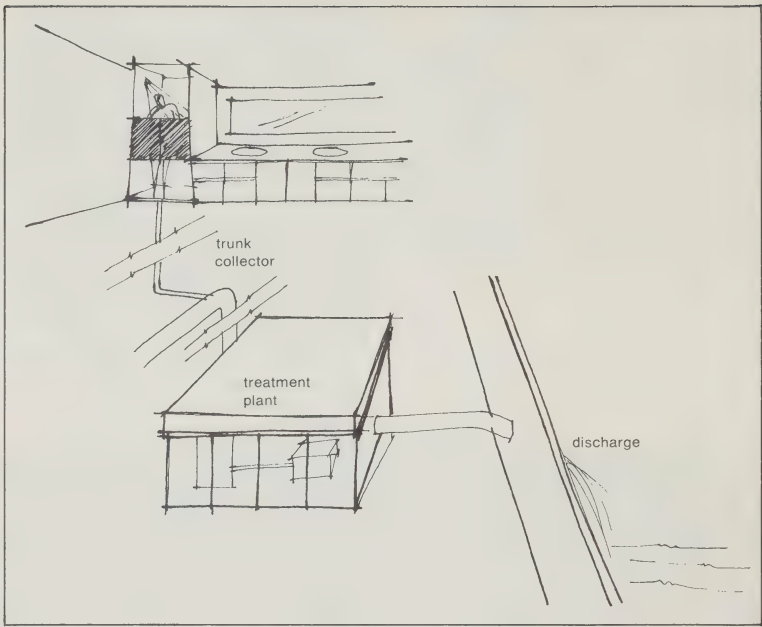
- be a minimum of 50' from the building;
- be built on a solid base;
- have the hole filled with broken stone 6" to elbow;
- have 12" of gravel fill around hydrant to prevent freezing; and
- never be set on concrete.

Pressures at hydrants should never be less than 20 p.s.i.

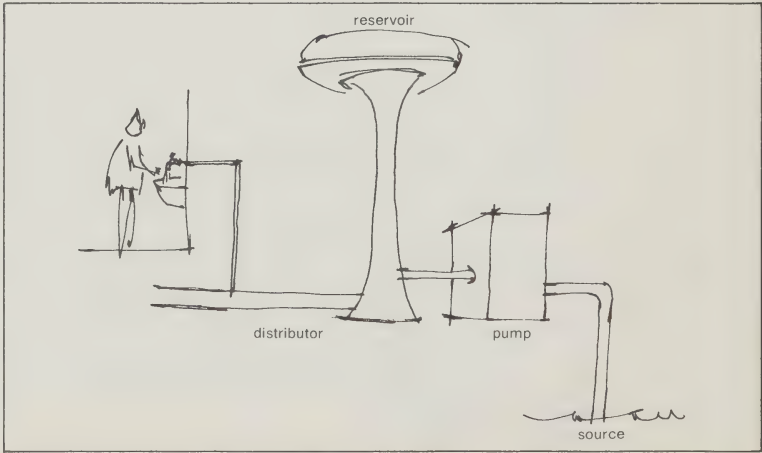
Pipe sizes should be 8" minimum for federal projects.

For general planning of a federal building, a daily 10 to 15 gallons should be supplied for each occupant, plus water for fire fighting.

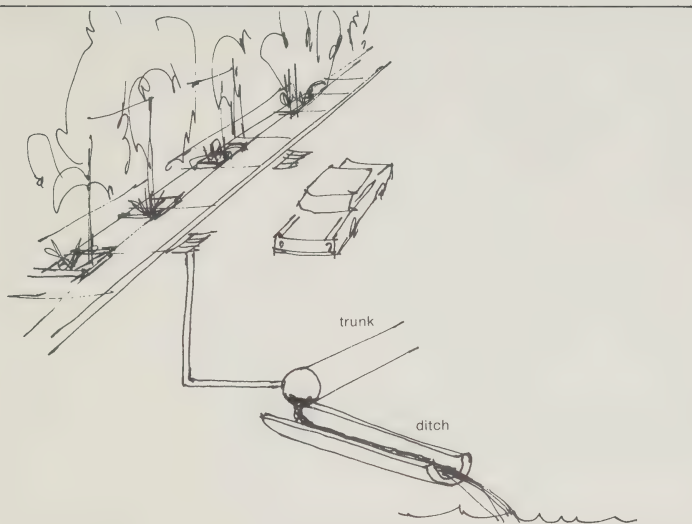
The quality of potable water should be checked to ensure safety standards.



Sewer System



Water Distribution System



Storm Sewer

Storm sewer — ensure that there is proper drainage of surface and run-off water by gravity without inconveniencing adjacent land parcels. The major categories are:

- open pits and channels;
- buried pipes; and
- drainage tiles (buried).

Some of the major characteristics are:

- large pipes of over 42" are usually made of concrete;
- curves may not be less than 100' radius;
- manholes must not be in excess of 500' apart;
- open areas should have a minimum of 1/2 per cent slope (away from buildings);
- pipe to be buried a minimum of 6';
- minimum slopes of pipes should be maintained at 0.3 per cent;

Landscape and site developers must be consulted regarding storm drainage and allowable connections to the street system.

Hydro power — is supplied by high-power lines and then transformed on the site to low voltage. Transformers should be centrally located with secondary lines that should not exceed 400' in length.

Similar to the water lines, the best distribution is a loop system. Conductors should preferably be buried wires except in rocky areas or areas that have a high water table.

If poles are used for overhead lines, spacing should not exceed 125'.

Public areas require proper lighting. As a general rule, light poles may be spaced 10 to 12 times the height of the mounted light source.

In providing for electrical service check to ensure:

- adequate quantity;
- appropriate transforming capacity;
- aesthetic overhead distribution; and
- well-lighted public areas.

Practical Interpretations

Utility connections and installations should be carefully considered in the site selection and utilization process.

Avoid any layout which would necessitate forced sewer lines.

Locate buildings with due regard to minimum slope requirements of sewer lines.

Federal construction standards call for a minimum of 8" sewer pipes.

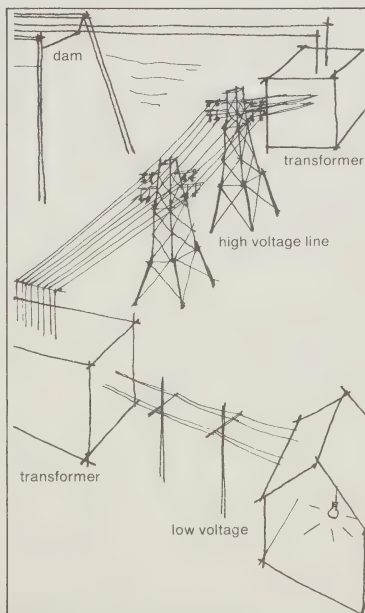
Federal construction standards also specify a minimum of 8" water lines.

Avoid dead-end water connections.

Secondary (low voltage) electrical conduits should not exceed 400'.

Public spaces require lights spaced apart 10 to 12 times the mounting heights of light source.

Surface drainage requires a minimum of 1/2 per cent slope.



Hydro Power

Part III

Theoretical Approaches



9. Physical Planning

124 SITE PLANNING

Site planning is the art and science of placing structures on a site in harmonious relationship with the environment.

Only a decade ago most practicing town planning professionals conceded that this is the main function and overall responsibility of the profession. In practice, of course, planning is highly complex and not merely a technically oriented process. While the main concern may be one of achieving a harmony between structures and environment, there are many other considerations, not specifically related to the physical requirements, that must be met in the overall planning process.

Site planning, nevertheless, is the actual physical implementation of theoretical planning and as such provides first-hand evidence of the planning process.

The proper approach to site planning is to make a survey of the site's physical characteristics. This produces a proper understanding of the potential the location offers for development. This is followed by an analysis of all the functions planned for the site.

The site potential, if it is understood in proper relationship to the functions to be accommodated on the site, will quite clearly determine the development objectives that could be adopted for the use of the site.

Previous discussions (see *Site Utilization*, Chapter 6) presented a number of physical criteria and considerations regarding site utilization. It is now convenient to emphasize a few aspects of site planning that will influence the interactions between various physical characteristics and functional aspects. Principal considerations may be:

- location of activities;
- visual appearance;
- proportions in use;
- environmental management; and
- protection against blighting influences.

Activities, not only those which are included in the building, but others which are generated by it, should be well sited. There are sites which have frontal activities on more than one side, resulting in a potential need to face in various directions consistent with the main activities. It is strongly recommended that public



Cityscape

buildings should always be oriented — with regard to main functional affiliations — in one direction only. In this respect, once the main function is oriented, the proper order of importance or priorities of other activities should be examined and established accordingly in relation to the site. Since interactions between functions are to be protected, this would determine the relationship of one unit to another.

Appearance — the final appearance of the structure and treatment of the site will create an impression on every visitor or passerby. Thus, the overall impression of the finished project should present organized well-thought out attractions. Dimensions and proportionate relationships between site, individual units and details of the structure itself should add up to contribution to the overall character of the

area. Most of these considerations are well within the architect designer's authority. Planners, however, should help in the interpretation of the general character and siting of individual units to fit an overall concept. Elements of landscaping should be developed by landscape architects to enhance the visual character of the site development.



54 Proportions

Proportions are most important in site planning to avoid overloading of the site itself or of individual structures. Rear, front and side yards, internal courts and open areas should not only be situated in proper relationship to the overall use concept, but should also represent a fitting proportion to structures and massing on the site. The proportions of used and unused areas should be established not only with regard to economic use aspects, but also in proper proportions to the overall development.

Environment management in site planning should consider not only the provision of light and air and the advantageous utilization of natural amenities, landscapes, etc., but also be concerned with protecting the atmosphere, flora and fauna. And, not least of all, the quietness of the area should be protected from any undue ill effects that may be occasioned by the new development.

126 *Blighting* (area impairments) will occur in any location in due course. This condition can, however, be minimized or its progress slowed down with the application of protective measures.

Typical blighting influences may be identified as:

- overbuilding (crowding) of the site;
- overloading utility lines;
- overcrowding road approaches;
- a result of using cheap building materials;
- permitting unsuitable functions;
- a result of implementing undesirable design details;
- over- or under-decorating;
- a result of neglecting safety and health protection;
- a result of selecting inappropriate directional orientation; and
- insufficient light, air, etc.

Practical Interpretations

Site planning aspects to complement the environment should be defined for the assistance of the architect designer.

Structures must represent or generate only such activities which are to be properly located on the site.

Visual appearance should be organized and be suited to the environment.

Proportions between individual units, neighbouring structures and relative to the site itself, should be in harmony one with the other.

Environmental qualities should be protected.

With the enforcement of good controls, blighting influences should be minimized.



COORDINATION

The aspects of coordination — so important in the planning process — have already been discussed at length. However, the necessary coordination of physical planning with other professional expressions, overall plans and surrounding milieu, should now be mentioned.

Town planning, necessitating, as it does, the involvement of a number of various professionals and their views, is altogether too complex to be encompassed by any one profession in the decision-making process.

Site planning is the town planner's expression of a site's physical development. It should, however, satisfy many other requirements as well.

Other professions, which would influence site planning decisions and should be consulted are:

- engineers (civil, municipal, traffic, mechanical, geological, electrical);
- architect designer;

- landscape architect;
- sociologist;
- economist;
- realtor; and
- municipal lawyer.

Overall plans for development usually state principal categories and overall balances of land uses, transportation systems and servicing aspects (comprehensive plans). The statements often contain no rules of detailed development for sites directly. The land-use functions and service requirements, nevertheless, dictate indirectly a systematic site development best suited to the overall objectives. The necessary coordination of these overall objectives would obviously save time, money and efforts.

The *surrounding milieu* reflects a certain character and represents a kind of local flavour that should be observed

in the type of development. North American tourists visit far-away places regularly to enjoy the special physical characteristics of a foreign country. The comparatively recent industrialization of Canada has not always been accompanied by a corresponding awareness of the extreme importance of preserving the special local characteristics of the Canadian environment. In this respect, not only planners but also various levels of government have been increasingly concerned with the integrity of land uses.

Practical Interpretations

Learn about the requirements of other professionals and coordinate physical site plans with their working interests.

Learn about the provisions of overall plans, understand the implications of the site and coordinate them with the plans.

Identify the special character of the area and develop site plans in line with those characteristics.



The belief that professional requirements could (and should) always be described and controlled by standard regulations is a commonly held fallacy. The principles of aesthetics are, by their nature, intangible, hard to define and equally difficult to control absolutely.

Emanuel Kant, a 18th century idealist philosopher, described beauty as " ... something which pleases without involving a selfish interest." *Architecturally speaking, aesthetics encompass judgements dealing with beauty, harmony and order insofar as they apply to unwritten personal preferences with regard to the combined characteristics that are visible in the structure and the development of the site.*

It should, of course, be stressed that there is no inflexible rule to identify beauty and a pleasing physical appearance. People maintain, and often change, their personal preferences and taste as a result of many causes too numerous to discuss here. Aesthetic considerations are influenced to a degree by general cultural trends. Nevertheless, they still tend to remain personalized and subjective.

However, there are commonly accepted rules. For example, monotony, the endless repetition of a uniform element, is tiring and repellent. The impact of radical changes in successful physical attractions is also generally resisted and considered disturbing. While this implies that aesthetics could be based on rules accepted objectively by everybody, the truth is that there are both subjective and objective elements present in an aesthetic appreciation. Some rules should always be observed, some others may be applied as a personal decision subject to time and space considerations.



57 Urban Order



58 Urban Disorder

Some of the widely accepted principles that should be generally observed are listed below:

- avoid sudden changes;
- break up monotonous repetition of the same details;
- use contrasting elements in a sequence order;
- consider light and shadow effects as elements of the design;
- apply decorative elements in moderation;
- avoid appearance of economic simplicity;
- consider appearance from different viewpoints where people may stand to look at the structure;
- consider the general view together with background, surroundings, etc.;
- there should be a reason for each concept;
- physical appearance should not be in conflict with actual functions;
- physical appearance should be such that they will be appreciated in all seasons.

Aesthetics in connection with town planning concepts should serve to improve the quality of the federal physical

development with special emphasis on the various types of urban attractions. These additions should enrich the urban space and provide not only for sound business interests, but also for human activity and enjoyment.

There is no doubt that the collective needs of urban inhabitants are among the most important factors to be considered in shaping the urban milieu. The physical setting and its overall appearance should, therefore, give expression to these human desires by the introduction of the visual characteristics that mirror the most commonly held interests of the population.

Practical Interpretations

Avoid negative rules of aesthetic appreciation.

Consider local taste, background, character and use decorative elements in keeping with local characteristics.

Avoid a general appearance of simplicity for economic reasons.

Avoid the sudden and crude use of elements designed to catch interest but which offer no attraction.



59 Sudden Change



60 Economic simplicity

The connotation of the word "environment", which once referred to the sum total of social and cultural conditions that influence the individual and communities, has been modified in recent times. Although the original connotation has been retained it now also refers to natural conditions of air, land and water largely because of the extent to which they are affected by human activities. Environmental considerations are not only pressing social and political issues, they are also key factors in the planning of federal projects as well as other land use developments. Natural conditions of climate and terrain vary considerably from pleasant and hospitable to the extremes of adverse climate and inhospitable surroundings. Some conditions, such as attractive vegetation or scenic views, may be integrated naturally into a planning concept to enhance the impact and the success of the project. Other conditions, such as seasonal flooding or unstable sub-surface conditions, may preclude or inhibit the success of the project to the extent that the proposal will have to be modified or abandoned. For the success of the project, as well as the protection of the environment, it is therefore imperative that the influence of the regional environment in land use planning be fully understood.

In federal developments, protection of the environment is a goal in itself. In many cases, especially in urban or other built-up areas, the achievement of this goal is virtually impossible because of the cumulative effects of earlier commercial or industrial developments and/or more recent adjacent uses on the natural conditions of the site itself. In other cases, where natural conditions have been preserved, planning must stress the fostering of a positive balance between the project and these features. Where a building or its associated activities may have a negative impact on natural conditions, impartial counteractive measures must be undertaken. Such measures might, for example, include erosion control, landscaping, pollution control or wildlife habitat improvement.

Many natural features may be deliberately incorporated into a plan as a fundamental part of the design concept. Such features as vegetation, bodies of water or views, should, by every practicable means, be preserved as assets to complement or beautify the final structure. Unquestionably, a building becomes much more attractive if it is situated in a pleasant, natural setting. In an urban area, natural amenities may be few and every effort should be made to preserve what natural assets may still remain. Landscaping may be used as an effective supplement to natural conditions. In undeveloped areas, natural features may be much more favourable for aesthetic planning and the scope for interpreting them into the project design will be much greater.

The natural environment may be used to provide for certain opportunities that are becoming scarcer and scarcer in the urban setting, but which are now considered to be even more necessary for a healthful and satisfying existence. Natural areas offer space for passive recreation, for relaxation, and for relief from the man-

made structures of the urban scene. While there may be overriding factors of functional location and access, siting of federal projects adjacent to parks and open space is likely to be invaluable in terms of employer and employee relations.

Practical Interpretations

Respect policies and goals that are devoted to managing the natural conditions of a site with regard to a federal development. Environmental goals and policies will be concerned with preservation and conservation, the provision of open space, outdoor recreation and aesthetics.

Do not adopt a development which will over-utilize (crowd) the site.

Undertake a resource inventory of the site and its environs. The inventory should analyze and take into account the flora, fauna, geology, bodies of water and physiographic features on or related to the site. The analysis should also include assessments of quality and quantity, economic value, recreational value, amenity value and ecological value.

Determine how to obtain the optimum integration of the most advantageous features into the plan. Consider how to overcome or counteract natural hazards and ascertain what conservation measures will be necessary.

Use landscaping to supplement the natural characteristics of the site.



10. Social Planning

132 GENERAL

Whereas physical planning concerns the physical structuring of a community and economic planning concerns the economic milieu, social planning concerns the community's inhabitants, how they relate to physical and economic development, and how their daily lives may be improved through planning. Social planning is not an isolated discipline practiced only by social planners. It is rather a factor which pervades the entire practice of town planning. Indeed, social planning, through its own methods, provides the basic informational background on the community's population and analyzes how people's lives may be affected or improved by a new development. In this way the realistic comprehensiveness of a plan may be assured and consideration for the citizen maximized.

Social planning may, and often does, involve a wide range of issues. Discussion under the following headings will therefore focus on certain selected items which are of direct relevance to the planning of federal projects.

Regional Coordination deals with the regional context within which a development will take place. It concentrates on political, economic and social coordination of the project relative to the community and the region.

Income and Occupational Groups directs attention to the two main socio-economic variables involved in development.

Ethnic Considerations refer to minority groups and how they relate to federal developments.

Community Facilities refer to those public facilities which are to accommodate the basic cultural, educational, recreational and service needs of a community.

Citizen Participation is concerned with the involvement of the citizens in the planning and decision-making aspects of the development. It refers to the extent to which citizens may influence the institutionalized processes which shape their community environment.

Demography provides an analysis of the factors which are critical in understanding the population base of the community. These include characteristics relating to population size, composition and distribution.

Political Considerations refer to governmental or political influences on the planning process.

Values, the last section, examines how people's values, attitudes and sentiments may influence planning.

Practical Interpretations

Federal structures are part of the urban milieu and should be located with due respect to the community's social requirements.

Regional and local aspects differ from one another, so the same project may not be appropriate for the same purpose in another area.

The primary purpose of federal structures is to serve the needs of the government; this should, nevertheless, be coordinated with social planning principles appropriate to the urban functions.

REGIONAL COORDINATION

Regional coordination refers to the integration of a development with established or projected political, economic or social patterns existing in a region. A region may refer to an area on the basis of political, economic, social or physical homogeneity; it may include an area represented by a municipal, provincial or federal government; or it may be an area under the administrative jurisdiction of a regional authority, such as a conservation authority or regional development association. The concept of regional coordination is broad because of this wide variation in the nature of a region. In town planning, however, a region is understood to refer to an area larger than a defined community but no larger than the nation.

Regional coordination is necessary to achieve or maintain harmony and balance within and between regions. In the planning of federal developments, intra-regional coordination is important because the project must be integrated into the surrounding region. Inter-regional coordination may be significant where relationships between regions are involved. The ultimate objective of these measures is to ensure that the development will conform to or promote the goals and aspirations of the region.

Political or governmental factors are probably the most prevalent aspects involved in regional coordination. In the development of a federal project, government involvement is often multi-levelled, that is, several levels of government may be involved including federal departments, municipal and local governments. While the federal government acts as the developer, other levels of government will have their own areas of jurisdiction. A city or town council, for example, will impose zoning regulations or other building restrictions which are expected to be met. A new development involves recognizing and coordinating these different authorities (See also *Political Considerations* in this Chapter). Coordination must take place by establishing which authorities may become involved in the project, the extent of their jurisdiction, and then coordinating the project in accordance with their requirements. Coordination often includes harmonizing the requirements of departments within the federal government.

Economic factors may not be as well defined but are still important and susceptible to the impact of new developments. The relationship is bilateral in that the economic milieu of the region may affect the viability of the community. Economic factors include: labour force composition, occupational mix, productivity, income levels, and industrial and manufacturing activity. These all, however, have social consequences. New developments must be examined in terms of how they will affect these, for example: Will they increase labour force participation for males, females, ethnic groups, etc? Will they affect the relationship of primary, secondary and tertiary industries? How will they affect incomes? Conversely, economic considerations will include: the availability of a suitable labour force, the availability of any essential industrial services, etc. Finally, new developments may be coordinated with regional economic development programs under way in the region. They may be used to stimulate growth in certain areas, to increase incomes and employment opportunities or to diversify economic activities within the region.

Social factors include a variety of patterns associated with demographic characteristics and interactions which are prevalent in the region. Socially, the relationship between a region and a community becomes established over time; patterns have stabilized. New developments may affect such patterns by creating additional needs for housing, schools, social services, and amenities such as recreational or cultural centres.

Developments must also be coordinated with existing facilities and patterns. Site planning is the key to this coordination. Certain locations will be more advantageous than others. Values may also be affected on a regional scale (See also *Values* in this Chapter).

In view of potential political, economic and social impacts, regional coordination is a necessary element in planning new federal developments. Impacts may be negative or positive and, in either case, will reflect the image of the federal government. Regional coordination is necessary to achieve compatibility and to ensure that positive linkages are maximized. If coordination is effective the success of the project will be closer to realization.

Regional coordination is facilitated largely through communication. Proper channels for communication between different levels of authorities, especially by planners and decision-makers must be established, maintained and utilized. Such channels may include normal correspondence, meetings, reports, etc. The basic objective is to achieve an accurate and complete exchange of all essential information. In addition, impact studies may be carried out to anticipate potential impacts on the region. To supplement both of these objectives regional analysis studies are undertaken to provide the basic data and information required to assess the nature of the relationship between community and region and to assess the overall impact.

Practical Interpretations

Identify and examine each of the impacts which the development might create on the regional scale. Decide how to maximize the positive impacts and minimize the negative impacts. This should

be achieved through cooperation with regional authorities and with other government agencies.

Identify the regional authorities which may be involved in the development. These may be local authorities or councils, the provincial government, and other departments of the federal government.

Determine the nature and extent of governmental jurisdiction with regard to the development. This will involve analysis of multi-level governmental standards or requirements which must be met and perhaps other considerations as well. These authorities may also be useful as sources for the provision of local or regional information which may be vital to the success of the development.

Establish and maintain good communications with these authorities throughout the planning, design and construction stages of the development.

Carry out any regional analysis studies which may be necessary to advance the coordination of the development with the region. Such studies commonly focus upon aspects of population, the labour force, the economy and transportation.

On the community or regional scale, income and occupational groupings are probably the most useful socio-economic measures. They are social in the sense that they influence social patterns such as social participation, consumer behaviour, status, educational attainment, etc. They are economic in the sense that they are determined by or influence the economic base. Occupational groups, for example, are determined by the type of economy (urban-rural, industrial-agricultural, etc.); income characteristics, however, influence economic variables, such as market demands, economic viability of various enterprises. Together, income and occupational groups will influence, and will be influenced by, the planning and development of a community.

Occupational factors include size, composition, and sectoral distribution of the labour force, unemployment and employment planning. Income factors are usually expressed in terms of the relationship of income levels to various demographic groups. Income analysis involves consideration of: the job type; the age, sex, educational level and skills of the individual; and the economic strength of the community. Both factors will be affected by new developments through the generation of new opportunities, new labour force demands, new demands for services, etc. The federal government is a major employer whose activities have a great influence on income and occupational factors.

These relationships are determined through the analysis and projection of existing characteristics and trends. The factors are analysed in a variety of ways. For occupation, one of the most useful groupings is shown below. It is a simple classification and not based on income. Income is usually classified by levels featuring ranges of income.

Table 17 — Occupational Groups

White Collar	Proprietary & Management Professional & Technical Clerical Commercial & Financial
Blue Collar	Manufacturing & Mechanical Construction — skilled Construction — unskilled
Primary Industrial	Agricultural Fishing, Hunting, Trapping, Mining, Quarrying, Logging
Service	Personal Recreational
Transportation & Communications	

Source: DPW-HQ Town Planning, 1972.

Participation in each group will vary with the employment opportunities available (the demand) and fluctuations in the labour force (the supply). Participation therefore reflects technological change (such as automation), societal change (such as the shorter work week) and changes in demands for goods and services — for example, in the sense that the personal service group is undergoing relatively rapid growth. Unemployment in general and by sector becomes a corollary of these conditions.

Employment planning involves the coordination of future labour supplies with expected labour demands. Labour demands are forecasted by analyzing projected changes in the demand for goods and services and other societal and technological trends. Labour supply projections involve consideration of the existing labour supply and population growth. Employment planning may include such goals as increasing the participation of females or minority groups in the labour force, etc. The planning of a federal development must coordinate the project with the necessary labour supply available in a community or region at the completion of the project. It also involves the maximization of the benefits of the development with respect to a community's existing occupation and income structures.

Practical Interpretations

Determine the income and occupational characteristics of the community involved. Certain information should be available through local or provincial sources or through the Census of Canada. Other information, such as projections, may have to be obtained through special studies.

Determine the manpower requirements of the development. If they cannot be met within the community another location will have to be found.

Decide how to maximize the positive impacts of the development on the existing income and occupational structure within the community. A federal development can often be useful in alleviating unemployment or underemployment within a community. This should be a factor in determining the location of the development.

ETHNIC CONSIDERATIONS

Ethnic groups usually refer to numbers of people who share a common culture, language, nationality or history. The population of Canada consists of two major ethnic groups, the historical origins of which are French or English, and a number of minority groups. This section is concerned with the minority groups. In their cultural relationships with the two major ethnic groups they require special consideration in planning because they often have special and deep-rooted desires, needs or problems which are consciously associated with their traditional way-of-life. They tend to locate in their own enclaves where they are able to maintain their ethnic identity in relation to a larger, more heterogeneous, community. Also, they may, in some instances, be disproportionately involved with social problems, such as unemployment, crime, slum housing and discrimination. In essence, they are a part of the Canadian milieu and can legitimately demand special consideration in planning.

Physical and social planning represent two means by which their interests may be served. These are primarily the responsibility of local or provincial levels of government, but the federal government does have jurisdiction in affairs relating to native peoples and to immigration. Federal involvement may also extend to those developments which will affect certain ethnic patterns, such as town planning in the native communities of the north. Where ethnic factors relate to participation, values and political considerations will become involved. Policy questions, particularly the question of assimilation versus non-assimilation, will also arise.

The Department of Public Works is, above all, concerned with physical planning, design and construction and has only an indirect involvement in social planning. Where situations arise concerning the quality of life of ethnic groups, the Department endeavours to support the interests of these groups. In such instances, the upgrading of an ethnic way of life is one of the objectives of planning.

Practical Interpretations

Recognize the legitimate existence of ethnic cultures within the community.



62 Ethnic Areas

This involves the determination of which groups are represented, their characteristics, and their specific needs, desires and problems with respect to federal planning. The Canada Census as well as local government offices are good sources of demographic information. Demographic analysis techniques may be used as well (see *Demography*, in this Chapter). Interviews, questionnaires, and other survey techniques may be used to obtain specific information about the needs, desires and problems of the ethnic group(s). Ethnic associations may also be consulted.

Make channels of communication available to ethnic groups and ensure that

these channels are publicised. Special efforts or programs may have to be developed to inform them of planning proposals, of opportunities for participation and as a means of encouraging them to participate.

Ensure that publications, programs and questionnaires are accurately prepared in the language that the ethnic group(s) will understand. This may involve multilingual presentations.

Where a certain concentration of ethnic development is discernible any federal project that is likely to have an influence on such an area and/or functions should be precisely coordinated with the known interests of the local inhabitants.



COMMUNITY FACILITIES

Community facilities generally refer to those physical improvements which are utilized communally, usually financed publicly, and which serve the basic cultural, educational, recreational and service needs of the citizenry. They are integral to the quality of life available in a community, yet their nature and extent may vary from place to place. They may be essential, e.g., police and fire protection facilities, or they may be non-essential but highly desirable as a means to expand the opportunities offered by the community, e.g., recreational and cultural centres. Usually, they will be established and operated by public authorities, but in some cases they may be provided privately.

While community facilities are generally a local or municipal responsibility, they may be directly or indirectly related to federal development. The federal government is responsible for providing certain facilities in villages, towns and cities.

Most commonly, these include local office operations such as agencies of the RCMP, offices of the Post Office Department, health stations and other facilities administered by the federal Department of National Health and Welfare, local offices of the Federal Department of Manpower and Immigration, Branches of Information Canada, etc.

More indirectly, federal developments must relate to locally provided public facilities. They must not be regarded or treated as isolated entities. In some cases, such developments should be planned so as to be compatible or complementary to local improvements. In other cases, they must be coordinated out of necessity or expediency. An office building, for example, should be located in relation to an available labour force, suitable transportation routes, and amenities such as shops, banks and restaurants for employees. This indirect relationship is an inherent consideration in site selection.

All federal projects will contribute to the community, and the economic viability of its area of influence. The locality itself, the quality and extent of the conveniences it provides and the atmosphere it creates will, in turn, contribute to the success and viability of the federal building.

In all cases, federal developments are planned, designed, and constructed according to the principles and standards maintained by the Department of Public Works in cooperation with the client department. The process endeavours to meet the structural and functional requirements of the client department, to facilitate the needs and activities of the community inhabitants with respect to the project, and to be compatible with the surrounding environment.

A number of basic principles are involved. Federal services should be located so as to maximize public convenience and accessibility.

Additionally, these services should be located in suitable proximity to other existing public facilities. This is often neces-

sitated by zoning constraints, the purpose of which is to ensure compatibility of land use.

Another aspect of community facilities development is design. While facilities are utilitarian and financed by public funds, they will become significant features of the community in terms of both functional and aesthetic value.

In addition to site selection, physical design can ensure functional value. Attractive physical appearance may be assured through careful and imaginative design. Functional and physical integration of the facility into the community will not only increase the effectiveness of the service but also enhance the image of the federal government.

A number of economic factors must also be considered. Most important — because the projects are publicly funded — their development should be economically optimal. This will involve an analysis of the type, quality and extent of community facilities to be provided, where and how they should be constructed and what will be their contribution to other public convenience facilities. The tax resources of the community (see *Tax Base* in Chap. 11) and how they are budgeted will affect the development of community facilities.

Practical Interpretations

Identify those community facilities which will be essential or desirable for the success of the federal development. These will include circulation facilities, services and utilities and employee amenities.

Determine the actual requirements for these facilities and allow for projected expansion or change. This will involve: circulation, services & utilities, employee amenities and arts & decoration.

Consult with local authorities to determine how these requirements may best be met. This will affect the site selection process. The development must be coordinated with the community facilities that are available.

If facilities are inadequate, an alternative solution will be necessary.

Site selection of federally developed community facilities should be in accord with a location which would be complementary to other existing community facilities.

Planning affects people. Citizen participation refers to the extent to which people are involved in the decision-making of the planning process. In effect, citizen participation represents a forum, by means of which individual opinions must be considered in relation to the way a community environment should be formed and changed. The extent to which people participate and the effectiveness of their participation will vary from community to community. Citizen participation is meant to complement and not to replace representative government and delegated authority. In planning, it may range from a legitimate and solicited input of information, opinion or decision, to a spontaneous expression of public discontent. It may, also be achieved through a wide variety of techniques and give rise to a corresponding variety of effects.

Planning a federal development will include consideration of the people of the surrounding community, that is to say, of a large metropolis or even a small, remote, village population. The success of such a project will depend not only on the structural and functional success of the building, but also on how well the project is received by the people. A number of factors must be considered in this latter aspect; basically, the compatibility of the project with prevailing ideals, goals and values of the community.

How these are determined and how they will be accommodated are the most important considerations with respect to planning. Planning is often straightforward in the sense that survey and analysis techniques should indicate the best proposal for achieving the desired result. In many cases, especially where people are adversely affected, public reaction may be negative.

The population base of a community may be broad and individual interests may vary greatly. Depending on the size of the project and the size of the community, many people, each in their own degree, may be affected and, some, adversely. It is in these latter situations that citizen participation becomes critically important in the interests of social harmony.

In any case, citizen participation is not meant to be a substitute for the input of professional planners and architects. Canada's democracy is based on representative government and delegated authority. Citizen participation should not displace or override the responsibility of those government agencies involved on a project. It should, however, supplement and assist the professional expertise of federal planners insofar as it provides additional information on the realistic needs, wants, and special characteristics of the community. In this respect, it is important to ensure that adequate and accurate information will be forthcoming if public involvement is sought. It should, nevertheless, be carefully noted that the information released to the public should not be such as to jeopardize the overall logic of successful implementation.

The extent or degree of involvement may vary from a situation in which there is no involvement at all (where, for example, full authority rests with the planning agency) to total involvement where citizens may have full participation. Citizen involvement is most effective when good lines of communication exist between planners and the public. It is least effective when pre-determined proposals are automatically adopted or when information or plans are deliberately withheld from the public.

Effectiveness of participation may be influenced by the techniques used. If there were unlimited participation, e.g., if everyone has a say, few decisions will be made because such a process is time-consuming in the extreme. It is therefore important to have a structured means of participation. Of the variety of techniques used, some consist of methodical dissemination of information (a prerequisite of good participation), others are used to obtain information, opinion or reaction. Dissemination of information includes the

release of reports, presentations, and publicity through the mass media. The information gathering process includes public meetings, questionnaires, interviews and an open-door policy on the part of the planners.

Public understanding, interest and support is an important element in the planning of federal projects. This is especially true where the project is a community facility or where it will have a great impact on the community. Yet active citizen participation is bound to vary greatly.

On the whole, citizen participation has tended to be minimal. Nevertheless, it has been active in virtually every project, sometimes in the form of public and private opposition. There is no direct means of public involvement in federal planning, but the public, as constituents, do have recourse to their members of parliament.

Practical Interpretations

Citizen participation will occur with or without a formalized process. The following steps are therefore intended to make citizen participation as effective as possible in the planning of federal developments.

Determine the purpose or role of citizen participation in the particular planning process. This role should, in part, be designed to inform citizens about the proposed development, the issues related to it, and the implications of the planning process from the point of view of the community. In addition, it should be designed to receive reaction from the citizenry as well as to elicit any other pertinent information.

Determine the most effective means of organizing a program of citizen participation with regard to the project. Before the program is activated it may be necessary to appoint personnel for the purpose of preparing a budget and procuring adequate funds. It will necessitate the use of various means of mass communication about the development itself, including publicity information about public hearings, questionnaires and campaigns, etc. Publications, questionnaires and interview forms should be prepared very early in the practical organization of the program.

Transmit citizens' comments to all participants and ensure that proper consideration is given to useful comments.

Implement the program. e.g., disseminate information, hold meetings, conduct interviews, mail out questionnaires and other planned correspondence, the purpose being to reach every person interested in or affected by the development. Representatives of citizens' groups and other relevant organizations are considered to be primary contacts.

Collect all presently available feedback information and analyze it in light of the development proposal. Whatever information which has been received will be useful only if it can be logically integrated into the plan.

Inform citizens about the progress of the development and the usefulness of their participation. This should include reasons for not accepting proposals made by the public.

DEMOGRAPHY

Demography refers to the statistical study of human populations. From the point of view of town planning or site development it provides significant background information about the population of a community which is or will be affected by a plan. Precise information concerning the characteristics of the population base is important because people represent the basic element in the total concept of community as a definable commonwealth. It is they who are affected: their needs, desires and activities must therefore be accommodated. Successful realization of a plan can only be achieved if complete and accurate demographic information is considered.

The demographer examines existing population characteristics and activity patterns, and projected demographic trends. More specifically, he analyzes the size, composition, and distribution of the existing population to determine current needs for various facilities and services, such as housing, schools, recreational centres, utilities. Demographic forecasts, projections of existing characteristics or activity patterns to an established target date, are used to estimate future needs for facilities and services. A complete and constantly updated data bank on demographic factors is therefore necessary.

Only a brief examination of a group of important demographic factors will be provided here. Population size is a straightforward measure expressed in terms of either cumulative population or total population by age, sex or ethnic group or per area. Density, a related measure, refers to the number of people per unit area, e.g., per dwelling unit, acre or square mile (See *Population Density*, Chap. 5).

Distribution refers to the numerical dispersal or spatial arrangement of the population among different areas. Distribution may be expressed in terms of total population or according to age, sex, ethnicity or other grouping. It may involve such factors as the in-migration and out-migration characteristics to and from a community.

Composition includes a number of characteristics, the most important of which are: age and sex composition, ethnic composition, family size and formation rate, household size and formation rate, levels of education, employment and income characteristics.

The importance of projections in providing demographic information about the future population will, of course, be obvious. However, there is an almost inherent difficulty in achieving accuracy. Projections are only useful to the extent that they are accurate in the context of information available at a given date. They must therefore be accepted solely as estimates of probable trends within

the foreseeable time period and should be revised as new information becomes available. These projections may be determined, by means of several statistical or graphical techniques which are based on the three elements of population change: births, deaths, and migration. For a discussion of the main methods, the following authorities may be consulted: Chapin, 1965, Chap. 5; Goodman and Freund, eds., 1967, Chap. 3. (See Bibliography).

Federally initiated planning usually takes into account the human elements of the community in which a development is to be located. Demographic analyses are undertaken in the initial "survey" stages of the planning process. The resultant information is used to optimize the coordination of the project relative to the surrounding community. It is by means of such analyses and citizen participation that project planning can effectively serve the best interests of a community.

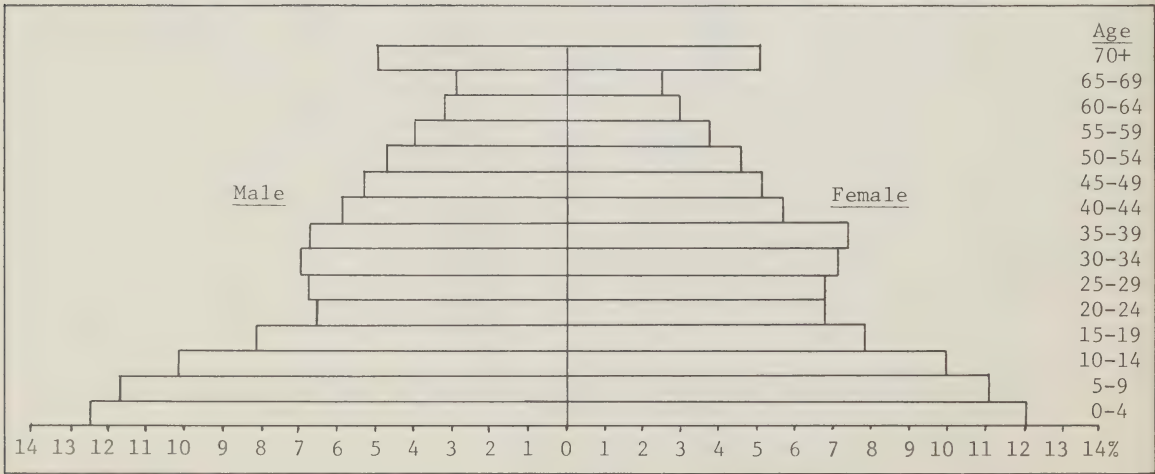
Practical Interpretations

Determine what demographic information is required to support the plan. Essential information includes population size, composition and distribution.

Information on population size is necessary to determine existing and future needs for facilities and services and the space requirements for various land uses. Existing population of an area is best analyzed by means of a graphical population pyramid with age on a central vertical axis, number of males to the left of the vertical axis, and number of females to the right (See Figure 64).

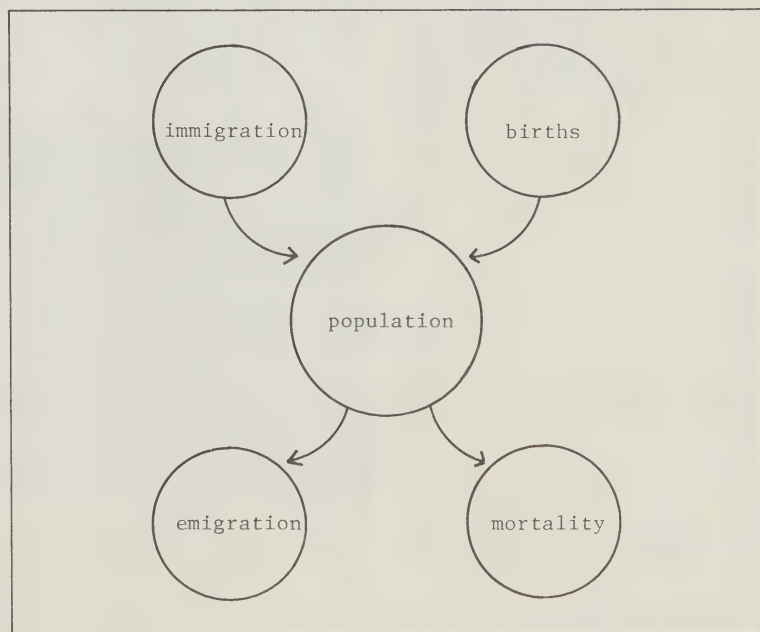
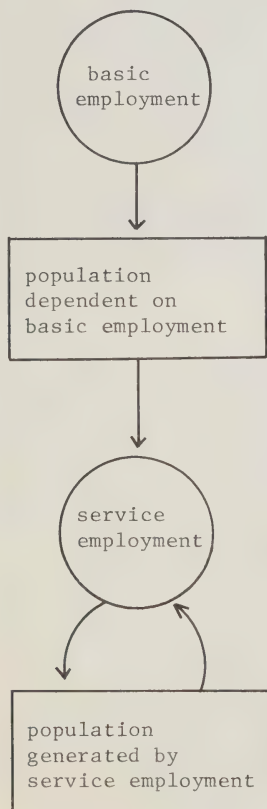
Future population size is calculated by projection. There are two basic approaches to population projections. The graphical approach involves graphical extrapolation of an existing trend, i.e., past population growth (or decline) is simply projected into the future. This assumes that the growth rate will remain relatively constant, but this is often an unreliable assumption.

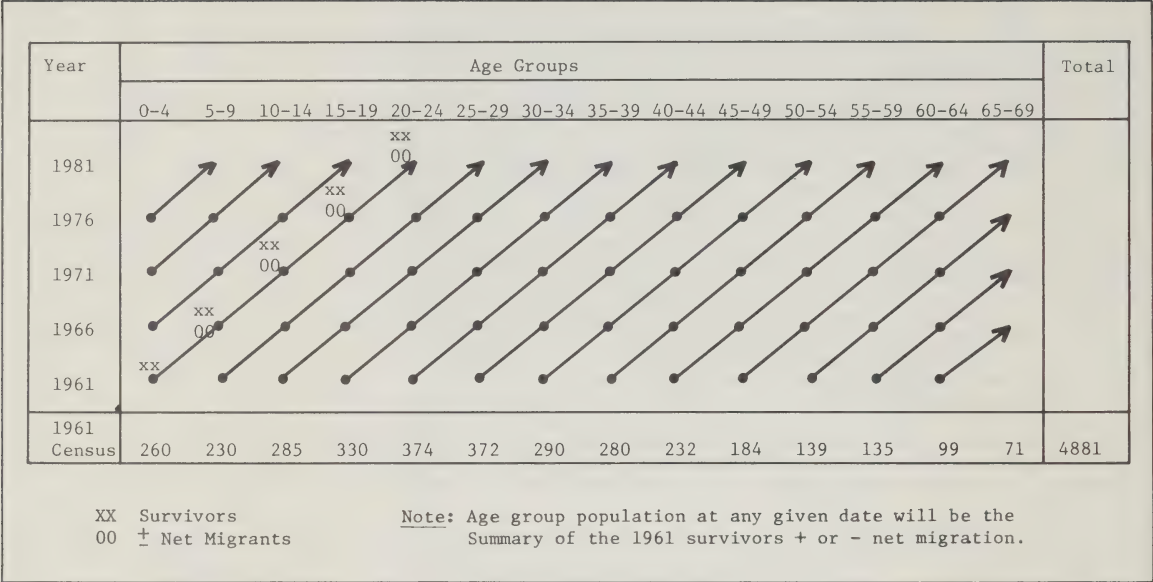
The migration and natural increase method is comparatively complicated but accurate. First, the net migration for the planning area is determined. This involves subtracting the forecasted total out-migration from the forecasted total in-migration. This should be based on projected market and employment analyses. The result may be positive or negative, but it will be crucial in estimating population size.



Out-migration and in-migration trends involve expectations of the future behavior of those factors which affect migration, such as employment opportunities. Natural increase projections involve forecasted birth rates and death rates. The net result of birth rate minus death rate will provide the estimated natural increase.

Such projections are usually done by age and sex groups and for periods of five years. The projections of net migration and net natural increase are then applied to the existing population to determine future population size. For a detailed explanation of this approach refer to the Survival-Migration Method shown in Figure 67.





67 Survival — Migration Method

Projections are also made on the basis of employment opportunities in the given area for both sectors (basic and service). The number of employed is usually multiplied by a factor less than the average family size to provide for more than one bread winner in a family. (See Figure 65.)

Information on population composition is necessary to determine existing and future needs for services and utilities, housing, education, recreation, etc. The most common elements of composition analysis are age, sex, ethnicity, marriage and levels of education. This information may be presented in graphic or tabular form and projected by means of methods similar to those discussed in the preceding paragraphs.

Information on population distribution is necessary to determine land use arrangements, such as the most effective locations for various facilities to meet certain objectives. Distribution refers to the spatial arrangement of population. A useful source of information is the Canada Census which provides demographic information by census tract.

Where essential information is not available, demographic surveys of the planning area may have to be undertaken. These surveys are usually in the form of questionnaires specially compiled and systematically distributed to elicit the pertinent information.

It must be remembered that the ultimate reliability of demographic information is directly related to the degree of accuracy and completeness of the basic data needed in the analysis.

POLITICAL CONSIDERATIONS

Although there is a real relationship between government and town planning it is one which varies considerably according to many different circumstances and at different levels of government. Consequently, it is almost impossible to define the relationship except in general terms for the purpose of this discussion. However, government can, and often does, exercise a major and perceptible influence on the goals, directions or achievements of planning. The science of government is expressed in decisions arrived at by parliamentary procedures. In brief, its field is the entire complex of the relationships between men and society. In the larger sense, it is concerned with the nature and existence of the needs and expectations inherent in industry, commerce and people. All planning, especially that which is related to the federal government, takes place in the context of federal programs. While working within the context of federal planning the planner must move toward those goals which are in accordance with his professional values and expertise.

Another reality of federal planning is the intergovernmental context within which a planner must develop his plans. This refers to the multiple levels of government authority which are usually involved in one way or another with a federal development. These levels include the federal government itself with its various departments, the provincial governments, and local governments, in the form of village, town, municipal or city councils. All have their respective jurisdictions, responsibilities and powers. Each body will formulate and administer public programs or policies, some of which may affect a federal project. Together, the levels form a network of executive and administrative authority and responsibility within which the planner (s) must function.

The planner who is in the employ of the federal government is responsible to that government as his employer. As a public servant, his function is to serve the public's interests according to regulations determined by the Public Service Commission. In addition, he must operate within the policy framework and constraints formulated by government. These various demands on the planner can, on occasion, create problems of coordination, competition, and conflict. They are persistent realities which cannot be ignored, but, at best, serve to sharpen the skills and capabilities of the conscientious planner.

Politicians have a legitimate interest in town and country planning. Projects of great interest are those which stimulate employment and sustain economic growth. Planning can also be used to stimulate other government projects, such as winter works programs and regional economic development programs. Another matter of interest in planning is the locating of federal developments. The elected representatives of the public are also interested in planning because planners often have the best criteria or information concerning the long-term growth of a community or region. The members of governments thus serve as a means by which their constituents are able to express negative or positive reactions to federal developments.

It should be noted, of course, that town planning is not a constitutional responsibility of the federal government. Nevertheless, the Department of Public Works, through the HQ Town Planning Section, does initiate town planning studies. Moreover, it serves as a consulting agency on various federal projects, and acts in liaison with other governmental planning agencies. Unless the development is for federal use, federal involvement in town planning is usually supplementary to provincial or local government involvement.

The planner's objective is to present a program which will be adopted and implemented eventually. Consequently, the planner will always occupy an impartial "middle of the line" approach in the processes of accomplishing the planned objective.

It should be understood too that whereas planners are responsible for the development of ongoing planning programs, the authority for final approval is part of a parliamentary process. Planners have no authority to act other than as professional advisers. They should, not be concerned with setting out the "best" plans — since, even in the most favourable conditions, these may be unrealistic — but should concentrate on presenting the most realistic "best possible" project. The greatest good may thus be the product of painstaking efforts to balance all the perceptible and less tangible variables inherent in the overall process of planning.

Practical Interpretations

In the actual context of planning assess the various opinions and interests that may exist in relation to a given project. Be clear about the policies and objectives which must be expressed in the development. Then decide how to coordinate the various influences effectively to meet the policies and objectives. Planning decisions are, in effect, governmental decisions. They may be subject to compromise if the realization of a proposal is to be achieved at all.

Do not try to force a decision, but do not fail to present alternatives and analyses of their effects on the urban milieu.

Most communities, especially smaller ones, have unique features to which their members attach strong values, attitudes or sentiments. These features may relate to virtually any aspect of the community, from traditional customs to historically, scientifically or culturally important buildings or sites. They may involve social patterns characteristic of a segment of the community's population or they may involve items of regional or national significance. On the local scale, a house might be held in high regard if it were the original dwelling of the first settler in the area or, on the national scale, it might, for example, be regarded as significant if it had once belonged to a prime minister. In either case, the house could warrant preservation on the basis of its historical value.

The diversity of values, attitudes, and sentiments which are important to a community may be wide. Moreover, identification of these factors may be difficult. Programs, such as the *Canadian Inventory of Historic Buildings* can be invaluable in identifying and evaluating historically significant structures. More difficult is the identification of intangible values,

attitudes, and sentiments which may exist, especially in older towns, or be held by ethnic groups. Whatever their nature, these features do exist.

Federal development, as with any other development, will have an impact on the community involved. This impact may be positive or negative and expressed in a number of ways including social, physical, economic, or aesthetic changes. From the initial stages of planning, the potential impact of a project should be anticipated. It should be developed as much as possible to contribute to the stability of the community by the various means already discussed. Any impairment of community life should be avoided as far as possible. Where conflicts with community values, attitudes or sentiments are foreseen, alternative proposals to relieve the situation should be considered.

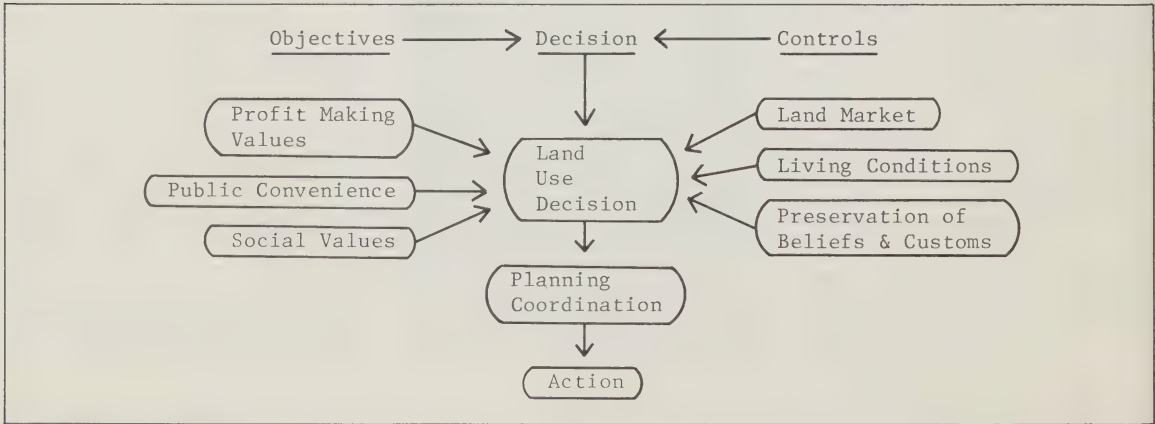
A federal project does carry with it the image of the federal government. Consequently, it must be in harmony with community as a whole. If a proposal receives a strongly negative reaction from the people of the community concerned, it would be in the best interests of the community as well as the federal government to examine the logic of alternative proposals. For example, if a proposed site for development is found to be in conflict with its historical importance to the community, it would be in the best interests of

the community and the government to look for a suitable alternative location. If no alternatives are available, the question becomes one of value: Is the new development of greater or lesser importance than the preservation of the historic site?

Citizen participation can be a valuable means of determining the nature and magnitude of the values, community attitudes and sentiments, relevant to a project. Whether or not these features are readily apparent, they will be sensitive to externally imposed changes. Citizen participation (See *Citizen Participation* in this Chapter) can serve to inform federal planners and architects about established values, attitudes, and sentiments and, thereby, assist in avoiding or minimizing potential conflicts. It is because certain values, attitudes, and sentiments have become acceptable that people are inclined to resist imposed change, even when it offers perceptible benefits.

Above all, federal projects are intended to serve the interests of the Canadian public. It is essential, therefore, that this fact be recognized in any federal development. The following comments should also be noted.

Simply, values are concerned with human needs and expectations; the needs must be in balance with the values that relate to the conditions inherent in urban living; correspondingly, expectations



must be equated with the values that are associated with the economic and social desires which supplement the necessities of urban living. Most apparent physical reflections are in the pattern of land use. Since environment and values influence land use patterns the reverse is also true.

Values set behavior cycles into operation. For this reason, success of government efforts in planning will depend on how closely the planning proposals harmonize with group and mass values held in the community.

Values are difficult to identify and measure. Different types of values are:

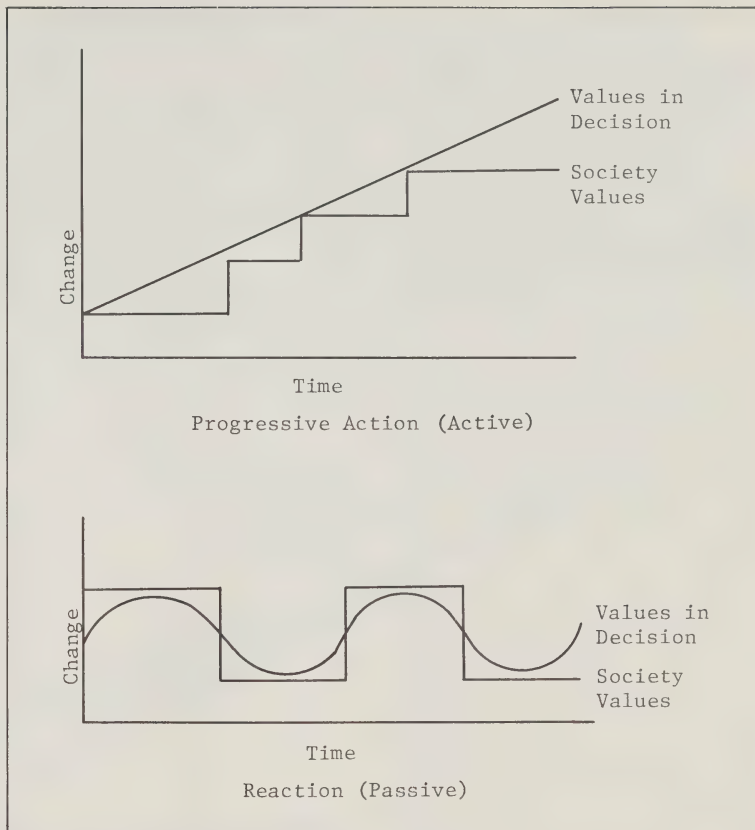
- livability values or public interest values;
- socially rooted values (cultural, historical); and
- profit-making values which may act singularly or in a total force.

Practical Interpretations

Attempt to identify and understand the prevailing values of a community towards its growth and development. Although difficult to discover, values can, nevertheless, become apparent by means of systematic interviews, questionnaires, direct observation, etc. (See *Citizenship Participation* in this Chapter).

Ensure that the development will be compatible with these prevailing values. More specifically, the development should be compatible with existing community features of functions, with surrounding land uses, and with surrounding architectural and aesthetic conditions.

Ensure that the development does not conflict with the community's interests in, for example, the preservation of a site or area from development.



In order to become an owner one must first obtain title to a piece of property. If the property is to be purchased, then one must pay out money — the purchase price — to the previous owner. This is called capital expenditure and, once paid, will not have to be repeated by the owner.

However, property owners have direct ownership costs that they must pay regularly if they are to retain possession of the purchased property. Some of these are fixed costs and must be paid even though the property is unused. Examples of these are real estate taxes or grants in lieu of taxes, insurance and minimum of maintenance as required by local municipal authorities. Other direct costs of ownership are operating costs and they generally increase with the size of the buildings on the property and depend on the use made of the land and buildings. There are numerous operating costs items, some examples of which are wages and salaries, utilities (electricity, water, sewerage), heating, property maintenance and repairs and insurance.

Direct costs (fixed, plus operating costs) are generally estimated in dollars per square foot of building space. These costs will vary from city to city according to the type of building or the use made of the building. The per square foot operating costs of an office building will be much higher than for a warehouse. Insurance rates depend on the type of building and the risk of fire at a given location. Wages and salaries will vary from one city to another and from one location to another within the same city. To further understand which items to consider in the cost of ownership see Table 18. This table shows an itemized estimate of operating expenses for a high-rise office building in downtown Montreal.

Table 18 — Cost of Ownership	
Items of Expense	Basic Subject Projection (dollars)
Real Estate Taxes	1.200
Water Taxes	0.024
Insurance	0.041
Cleaning	0.348
Wages and Salaries	0.330
Light and Power	0.250
Elevator	0.083
Heating	0.070
Maintenance & Repairs	0.160
Grounds & Parking	—
Garbage & Snow Removal	0.010
Supplies	0.025
Music Distribution	—
Security	0.040
Miscellaneous	—
Sub-Total:	2.581
Administration & Leasing	0.240
Legal, Audit & Professional	—
Fees:	0.020
General Office:	0.003
Telephone & Telegraph	0.003
Advertising	0.015
Miscellaneous	0.040
Sub-Total:	0.321
Total Operating Expenses	2.902
Say:	2.90/s.f.

Source: North & Leonard Site Selection and Proposed Office Building, Montreal, Quebec, 1971.

The items shown in the previous table are usually common for all types of buildings which actual expenses vary by type and location.

In addition to direct costs, there are indirect costs that should be considered. These are expenses that result from individual actions, but are not paid for by the parties responsible for them. Numerous examples can be cited. One case is where a building complex or industry dumps untreated sewage or plant wastes into a river. This necessitates high-cost water filtration plants for towns and cities downstream, the closing of beaches and the shutdown of commercial fishing. Another example is a poorly located building.

Often the site will be large enough to meet all of the on-site requirements of the proposed building. However, the complex could have an adverse financial impact on the surrounding area and existing systems. The on-site activities, if unsuited to the surrounding area, could result in lower adjacent land values and rapid building depreciation. If the surrounding road systems were being used near to their full capacity, then the complex could result in their being overloaded; this would cause lost time and money to all who use them. A large complex can also cause expensive alterations by the city to such utilities as sewerage and water mains.

Under-utilization of government land in urban areas will result in two more indirect costs. The city loses in the sense that the land is serviced but is not returning the taxes or grants-in-lieu-of-taxes that would be the case if the land were fully developed. In addition, the government has an opportunity cost. Money has been invested in the land but since the land is idle or not used to its full potential, the return on investment is not being maximized; this results in an inefficient use of funds.

Determining the direct costs of ownership is a financial matter and can only be handled by trained and experienced experts. However, planners should be aware of these costs and know how to use them in the site selection process. In particular, planners should be able to forecast adverse spin-offs and ensure that indirect costs are also considered in the planning process.

Practical Interpretations

Locate building sites in a manner that observes land use economics and minimizes cost of use. Do not locate land uses, such as light industry (laboratories, mail handling operations) in high-priced commercial areas.

Locate building sites in such a way as to minimize operating expenses (other costs being equal). The location will affect costs items such as transportation, utilities, insurance and wages.

Minimize indirect costs by using the land efficiently and by selecting sites that minimize adverse spin-offs or impact on the surrounding area.

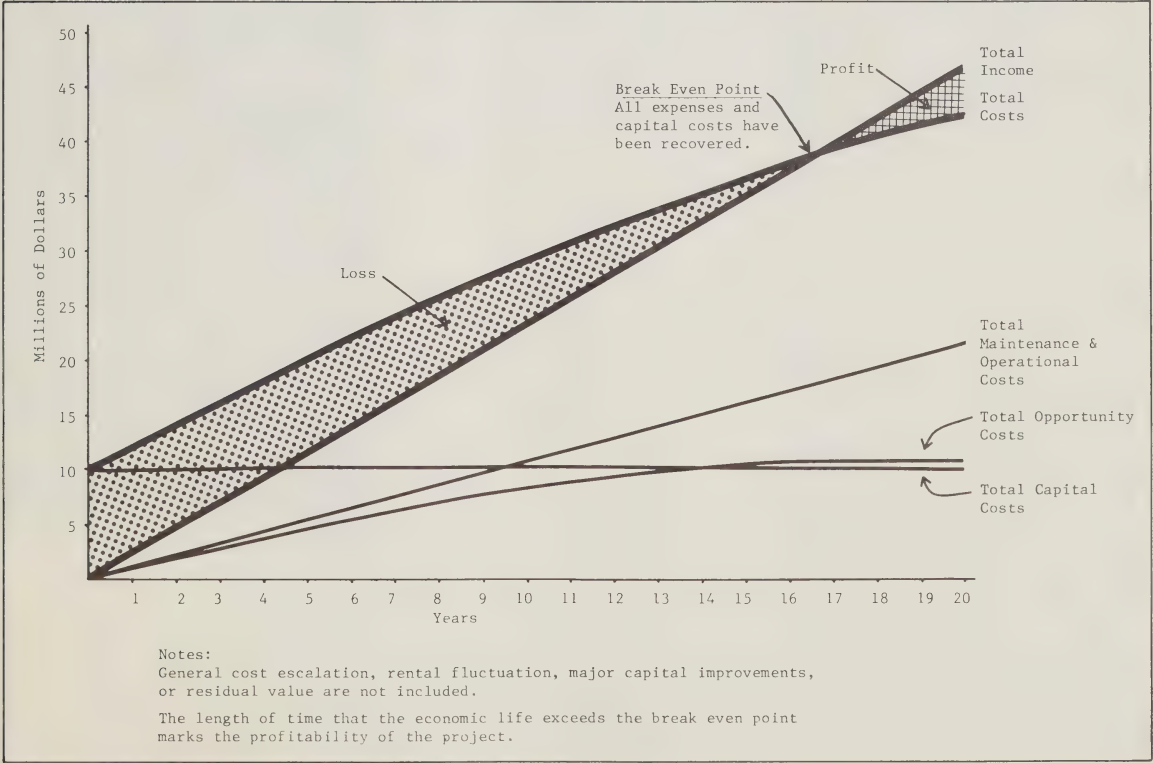
INVESTMENT SECURITY
(FEASIBILITY)

In its simplest form "investment security" means that a project returns enough cash receipts over a reasonable period of time to justify the original cash spent. Any method of analysis should involve some process by means of which the discounting of future cash inflows can be compared to current cash outflows. One problem that is often encountered in this respect is the uncertainty of future cash flows. The initial capital outflow can usually be estimated fairly accurately.

One method frequently used to check the investment security for a proposed office building is shown in the example below:

1. Estimate the costs of land and building (dollars)
Building costs
40,000 s.f. x \$25.00 = ... 1,000,000
land value 200,000
capital invested 1,200,000
2. Estimate the annual rental income
40,000 x 90% x \$5.50 198,000
less vacancy 5% 9,900
gross income 189,100
3. Estimate the annual expenses
40,000 s.f. x \$2.00 80,000
4. Calculate the net income (2-3) 109,100

5. Calculate the present value of land and building
Interest is 8% and the economic life is 30 years (\$109,100 x 11.258) = 1,228,187
(11.258 is the present value of \$1 payable annually for 30 years at an interest rate of 8%)
 6. Calculate the investment security (5-1) 28,187
- Since item 6 is positive the investment is secure provided that the basic assumptions are correct and the rental rates can be raised to offset rising costs over the life of the project.



The calculation of investment security is not part of the planner's role and it should be handled by financial experts. However, the results of a financial analysis forms part of the overall comprehensive planning process for a new development. Therefore a planner should be able to understand the analysis and its use in the planning process. Many of the public amenities such as plazas, fine art and landscaping proposed for new building by architects and planners, are non-revenue producing but they add to the capital costs of projects. An understanding of the interrelationship between rental rates, capital costs and interest rates will enable the planners to present their case with a full understanding of the amount to which rentals would have to be raised in order to cover the added costs.

Not all projects require an investment analysis; it can only be applied to projects that produce revenue directly. Some government projects, such as roads, bridges and parks, provide indirect returns (through social benefits and increased transportation efficiency) which are difficult to measure. These indirect benefits should also form part of project feasibility exercises.

Practical Interpretations

The investment security should be analysed for all projects that are revenue producing.

The security of an investment should not entirely control the decision making process for the government must spend money on some public projects that are non-revenue producing.

Be sure to read through an investment analysis and know how each of the main factors affect the final outcome.

An investment analysis is particularly useful for comparing similar projects, but it should not dominate the decision making process. Indirect benefits should also be considered and it is the planner's duty to build a strong case for them.

Rent plays an important role in an investment decision and future rental rates depend on the physical attractiveness of an area. Therefore, the site selection process should include some forecast to indicate the future status of an area.

MARKET POTENTIAL

A market study should be carried out for every accommodation project. The extent of the study and the way it is carried out depends on the size of the project and the functions to be served. Only a limited study involving just the client department is required for a special purpose project, such as a postal terminal. However, a comprehensive marketing study is required for an office building.

The purpose of a marketing study is to:

- analyse the existing supply and location of similar types of space;
- determine the existing rental rates for various locations and types of space;
- establish present and future demands for space by both the government and the private sector;
- establish a gross building size; and
- state the amount of space that will be required for government departments together with the amount of surplus space that can be leased to the private sector at a given rental rate.

A market survey could show that there is a surplus of existing space and that it would be cheaper to lease accommodations rather than build a new structure. It may also indicate that the location chosen for a new building could have a commercial potential which could be realised by using available accommodation in the lower floors of the building. In this case it should also indicate the amount of space and the rental rates that could be expected. Sufficient supporting data must be supplied to back up all conclusions reached in the survey.

Marketing surveys can only be carried out by realtors familiar with the area. Such surveys play an important role and should precede the site selection process.

Practical Interpretations

All accommodation projects should begin with a market survey.

In order to maximize the potential of the land, consideration should be given to providing rental space to serve other functions as indicated by the market survey.

The planner's role is *not* to prepare a market analysis but to apply the results of the study to spatial and quantitative alternatives.

TAX BASE

Property tax provides the means by which cities, towns and municipalities collect the major portion of the revenues used to finance their operations. With the exception of certain tax exempt properties and properties handled under alternative taxing arrangements, property taxes apply to all classes of realty. Certain public properties, such as churches, schools and hospitals are tax exempt. Federal government property is not subject to property tax. It is taxed in an alternative manner. (See later in this Chapter.)

As part of the property taxing process a non-exempt property is evaluated and assessed at some percentage of its market value. The assessed value is then multiplied by a mill rate in order to arrive at the tax payment due. For example, a property worth \$40,000 could be assessed at \$20,000. If the mill rate is 50 then the taxes due would be \$1,000.

The tax base refers to the total assessment that is taxed by one authority. The tax base can be broken down into commercial assessment, residential assessment and industrial assessment. Each of these assessments could be taxed at a different mill rate.

The federal government does not pay taxes directly but pays the taxing authorities, under whose jurisdiction it comes a grant in-lieu-of-taxes. The amount of the grant is based on the assessment of the property and the appropriate mill rate.

From this it will be seen that federal property has an ongoing financial impact on an area in the sense that it pays grants-in-lieu-of-taxes. Therefore, a large concentration of federal development in one municipality can ease the tax burden of other taxpayers. In this way the development aids building of the infrastructure

necessary for community development. For this reason the proper siting of large government projects can help to overcome regional economic disparity in Canada. Large-scale projects should therefore be coordinated with DREE to assure the maximum economic returns to an area.

Practical Interpretations

Government grants-in-lieu-of tax can be an important part of a municipality's tax base.

Planners should be aware that large projects have a long-term economic impact on an area.

Site selection in DREE designated areas should be coordinated with DREE to ensure a maximization of economic benefits.

12. Public Relations

150 INFORMATION AND REACTIONS

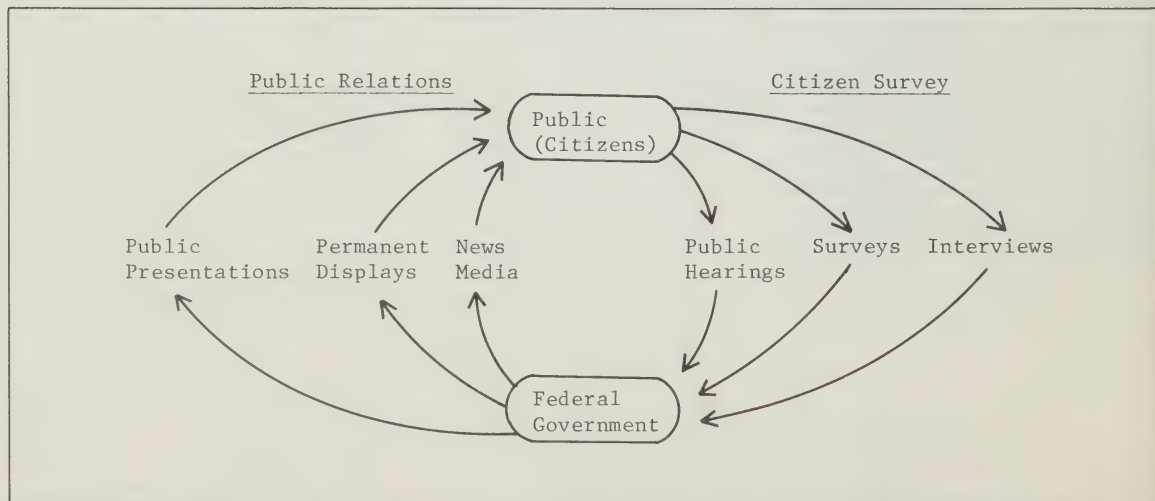
Local coordination is being practiced on a larger and larger scale by Canadian planning agencies. These agencies, including those of the federal public service, are increasingly aware of the importance of establishing and maintaining goodwill with the people of their communities, of explaining and clarifying their

roles and activities, and of listening to community reactions and comments. As recipients of planning action, citizens must be made aware of the nature and purpose of planning and they must be informed of plans and their implications. Citizens must also be encouraged to voice their concerns about their community and let responses to planning proposals be known. Goodwill and cooperation are based on a well-informed citizenry and recognized opportunities for participation.

In fulfilling these functions, public relations may be a one-directional or two-directional process. The former exists when the objective is to *inform the public*. In this case, information is dispersed through a variety of channels including press releases, public lectures and presentations, and publications. Some agencies will appoint a public relations officer with full-time or part-time responsibility. Others will treat public relations much more informally; that is, as more of a routine day-to-day affair. Information programs are undertaken to inform the

public about general issues, such as priorities, goals, opportunities for participation, etc., or they may be focussed upon interpreting a specific plan and its implications. Occasionally, programs may be promotional: agencies may deliberately undertake to promote a proposal they wish to introduce in the community. The objective of promotion is to gain public acceptance.

Public relations becomes a reciprocal process when *communications interchange* is fostered between planners and the public. Similar channels are used with the addition of public hearings, questionnaires, and interviews, whereby feedback of views and opinions is solicited. The objective is to establish or maintain a rapport which will contribute to the planning process. This involves the exchange of information, views, and the kinds of needs which will ensure understanding and cooperation. In effect, this is citizen participation (See *Citizen Participation* in the preceding Chapter) but it includes the direct application of the principles of public relations.



A two-directional public relations program is likely to be effective only if the communication is based on the exchange of complete and accurate information, a willingness to cooperate, and the existence of mutual respect among the participants. It will be ineffective if any one of these elements is lacking or as a result of a tokenistic attitude on the part of the authorities. Effective communication is essential to successful planning. Without it cooperation, compliance, and good relations cannot be anticipated.

In both one-directional and two-directional programs, it is crucial to identify the persons or groups that must be reached as well as the most effective means of communicating with them. The selection of suitable channels will depend on the extent of coverage, the duration of the program, and budgetary considerations. Programs may be directed at the entire population of a community or at certain segments that may be directly affected by planning, such as ratepayer's or citizens' associations, or other special interest groups.

Practical Interpretations

Be precise about the purpose of the public relations program and decide what information concerning the planning program, proposal or service is to be communicated to the public, what individuals or segments of the community should be informed; and what reactions or information should be solicited from the public.

Coordinate with the DPW Public Relations and Information Services Directorate for assistance, priorities and authorization, in order to avoid duplication of effort.

Develop a program which will achieve a specific purpose. Decide whether the program is to be short term or long term; themes, timing and approach will have to be decided upon. In addition, advisory committees may have to be established, public relations personnel appointed or consultants hired. Budgetary appropriations may have to be made. Material for publicity will need to be prepared at this stage.

Implement the program. This will necessitate selecting the best methods to carry out the program. Personal contacts, conferences, public hearings, news releases, speeches and opinion surveys are, of course, all effective as public relations techniques, but their applicability will depend on the purpose of the program.

Evaluate the results of the program and the effectiveness of the techniques used. Decide whether subsequent public relations action is necessary to reinforce the program.

The federal government's presence in any community carries with it a certain public relations value in representing its own image. The building itself, the aspects of its location, the spatial and functional relationships to the rest of the community, have a direct bearing on the acceptability of the image. All this will have a positive or negative impact on the federal image in the opinion of the general public.

In small communities, a new building, such as a post office, may be the only local representation of the federal government. Its site should therefore be selected so as to have a high degree of visibility in an attractive natural setting and com-

patible physical surroundings. The building itself should be designed to have a modern and impressive appearance that is consistent with a dignified and business — like effect. Any associated public amenities, such as parkettes, promenades, etc., which may be included in the development, would also have public relations value.

Careful attention should be given by planners to the fact that an improved physical appearance or a preferred functional relationship will obviously require public funds and incur extra expenses.

Restraints are to be applied to the extent of selecting better but more expensive alternatives. Indeed, it is not only a planning, but also a governmental, consideration as to what extent the federal image should be presented (i.e., improved, average, poor or luxurious appearance).

Practical Interpretations

In the development of a federal building, siting and design should foster and enhance the federal image in the community. Siting should be compatible with the community land use plan, the existing community features, and local values. The design should be modern, attractive, and suitable for the purpose of the building.

Planners should present alternative solutions together with the corresponding variations in costs and expenses.

Improvement of the federal image costs extra dollars and the need for an improved setting to meet federal functions is always a matter for governmental decision.

Certain minimum levels of quality should be observed to ensure that no federal functions will create any nuisance or ill effects on the community's functions or physical appearance.



13. Methodology

STEPS

Town planning decisions should be based on comprehensive studies and reports prepared by qualified professionals for the purpose of investigating all the relevant factors regarding a certain development concept. Studies are not the same; scope and objectives are different and should be properly described in the terms of reference already discussed under *Requirements* in Chap. 1. Figure 73 shows general methodology steps in proper order.

In order to assist in understanding the methodology applied in preparing a study for the town planning aspects of a federal development program, the following 12 major steps should be taken:

- Contact the appropriate federal and municipal agencies to collect the available base maps and background information, learn details of future requirements and collect data.
- Study similar uses at other locations. Collect, summarize and analyse the data received.
- Coordinate, assess and analyze the information obtained. Learn about deficiencies and collect additional data as required.
- Undertake site surveys, counts and investigations (including the preparation of maps and/or pictures of physical conditions) of existing land uses, service connections, community facilities and other factors to a degree that will be sufficient to prepare a comprehensive study.
- Prepare and analyze data obtained above and, following further discussions with government representatives, prepare preliminary land use, site development, transportation, etc., plans and related general cost estimates.

- Analyze and assess the function and feasibility of utilities extension and capacity plans, as prepared by municipal engineers. Relate such plans to the development recommended in the preceding paragraph, including the setting of maximum holding capacity and optimum densities.
- Develop conceptual physical design aspects.
- Investigate and discuss the possible impact of new development on the surrounding area.
- Coordinate development and designate priorities.
- Prepare and present a preliminary plan, collect and analyze comments and/or criticisms.
- Finalize the plans and the study. Then complete the presentation work. Recommend further studies, policy and controls necessary as guides for ordinary future development.
- Prepare priority and coordination programs, complete general costs estimates and phasing, and make a final presentation.

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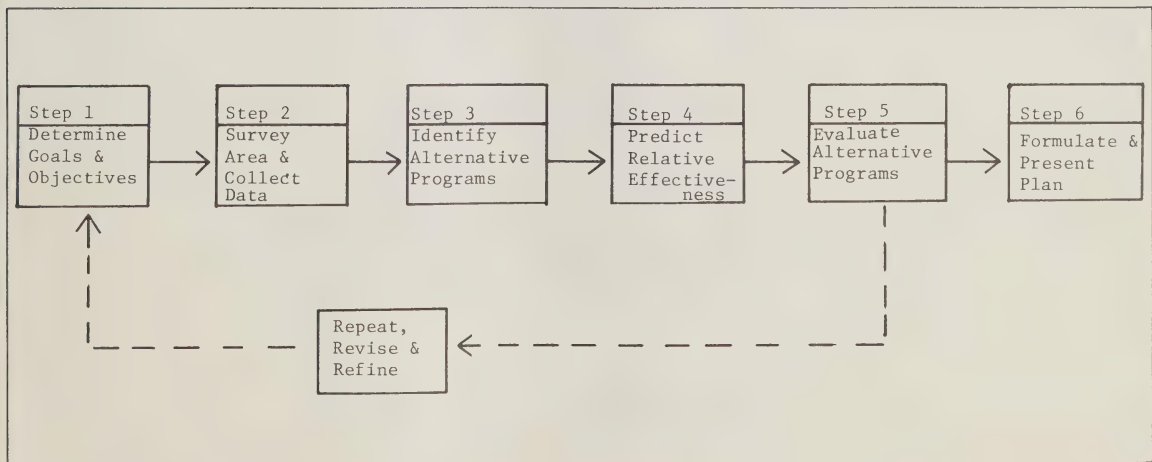


Figure 74 is offered as an example now to break down the work into individual phases for cost and time estimates.

In writing a report, it is most important to include a list of references to previous studies and other related reports. The report should, where necessary, also include references relating discussions in preceding chapters or discussions that will develop in the later stages of the report. These references will help to integrate the overall continuity of the report.

Tables, charts and plates should accompany the discussion for illustrations and summaries. Wherever a table or plate is presented some comments should be made in the text conveniently to introduce them to the reader, stating their use and purpose. A brief summary should also follow, the table, chart or plate, indicating the characteristics of the information thus made available.

Practical Interpretations

Studies should always be prepared on the basis of terms of reference.

It is most important to follow the sequence of steps already described.

It should be noted too that cross references in a report, help to knit the study together.

Tables and plates should be introduced and the consequences to be construed from them should be summarized.

74 Team and Time Allocation (Typical Land Use Study)

Methodology Steps	Work Breakdown	Specialists Involved	Man Days Req'd	Total Days Per Unit
1. Contacts	Preliminary Site Observation and Briefing	S. Dir. 2 C. P. 2 R. Appr. 1 P. Eng. 1 U. Eng. 1 L. E. 2	9	
	Collect and Assemble	S. Dir. 3 L. E. 3 J. P. 3	9	
2. Assess-Analyze	Analysis-Synthesis	S. Dir. 1 C. P. 4 R. Appr. 1 L. E. 2 U. Eng. 2	10	
	Regional & Sub-Regional Analysis & Synthesis	C. P. 3 L. E. 3 J. P. 3 U. Eng. 2	12	
3. Complete Surveys - Prepare Maps	Physical Analysis & Synthesis - Site	P. Tech. 10 J. P. 2 C. P. 2 L. E. 1 E. Eng. 4 U. Eng. 2 P. Eng. 1	26	
	Analysis-Synthesis	S. Dir. 1 C. P. 1 J. P. 1 L. E. 1	4	
4. Market Analysis - Realty Appraisal	Market Analysis a) - Realty Appraisal	L. E. 7 R. Appr. 3 S. Dir. 1	10	
5. Utilities Servicing - Municipal Coordination	Utilities Servicing	U. Eng. 2 T. Eng. 2 S. Dir. 1 E. Eng. 1 P. Eng. 2 J. P. 2 U. Eng. 4	5	
	Analyze Gov't. Policy	S. Dir. 1 J. P. 1 L. E. 1	3	
6. Gov't. Coordination & Plans Preparation	Commercial Uses	L. E. 2 S. Dir. 1	1	
7. Commercial Uses - Environment Coordination	Dev. Factors	R. Appr. 1 S. Dir. 1	4	
8. Gov't Requirements - Priorities	Coordination	S. Dir. 1 L. E. 1 T. Eng. 1	3	
9. Prepare & Present Preliminary Plan	Formulation of Land Use Plan	S. Dir. 3 P. Tech. 10 J. P. 2 C. P. 4 P. D. 2 T. Eng. 1	22	
	Market Plan	S. Dir. 3 J. P. 2 L. E. 4 U. Eng. 2 P. Eng. 1 R. Appr. 1	13	
	Preliminary Presentation	L. E. 1 C. P. 1 U. Eng. 2 S. Dir. 1	5	
10. Finalize Study and Presentation	Plan Formulation	E. Eng. 3 P. Tech. 15 P. D. 4 S. Dir. 4 J. P. 9 T. Eng. 1	36	
	Strategy & Policy	L. E. 1 S. Dir. 2 J. P. 3	3	
11. Priorities, Implementation, Final Presentation	Priority Order, Final Report - Presentation	L. E. 2 P. Eng. 1 S. Dir. 3 P. Tech. 5	14	
Total				199 days

Abbreviations

S. Dir. - Study Director	L. E. - Land Economics (Study Writer)
J. P. - Junior Planner	C. P. - Community Planner
R. Appr. - Realty Appraiser	P. D. - Planner Designer
U. Eng. - Utilities Engineer	P. Eng. - Planner Engineer
T. Eng. - Traffic Engineer	P. Tech. - Planning Technician
E. Eng. - Electrical Engineer	

TOWN PLANNING STUDIES

Town planning studies could include a great variety of types. The ultimate objective is always to learn something by deductive methods from the data collected.

The importance of adopting a basic systematic approach in order to arrive at the final conclusions should be carefully observed. In short, the methodology in building up any study should be based on: *survey, analysis and conclusions (strategy)* and in that sequence. This method and sequence will automatically exclude any preconceived conclusions.

The *survey* will provide a means of collecting all the relevant information, and *analysis* of the information will ensure that the causes are correctly understood. The *conclusions* will thus be derived as a consequence of the preceding two steps — survey and analysis.

Special Studies

Special studies could be concerned with:

- urban renewal
- land uses
- transportation
- densities
- public service
- municipal services
- recreation
- location aspects
- spatial relationship
- specific development
- regional development
- development controls
- visual appearance
- historical preservation

and many other subjects that may require an analytical approach in order to formulate a future development program. The proper methodology in building up the study will always require that, at the outset, the objectives and the scope are properly identified.

Whereas objectives are usually stated by the client as part of the terms of reference, the scope and the delineation of the actual physical limits of the area studied are quite often left to the planner's own discretion.

As a general rule it should be noted that before a study is undertaken, the *study area* and *planning area* should be clearly identified.

The *study area* will include a larger territory incorporating not only the part with which the planner is directly concerned, but all the neighbouring land that has a physical or functional influence on the program.

The survey will collect only overall and general information for the area and will concentrate on identifying those factors that are directly relevant insofar as they have an influential effect on the project.

The *planning area* will include only the site itself with its immediate surroundings insofar as they are directly affected by movements, functions or the visual appearance created.

The survey of the planning area should be thorough and adequately detailed.

Practical Interpretations

Special studies should be carried out on the basis of detailed terms of references.

The objectives of the study should be clearly stated by the client.

The "study" and "planning" areas should be delineated by the planner, preferably with the client's participation.

Detailed information is needed only for the "planning" area.

FINAL COMMENTS

The foregoing discussions contained in this publication should not be regarded as comprehensive in the field of town planning activities. They will, however, provide a useful set of criteria for the professional planner and others engaged directly or indirectly in town planning. The Bibliography included in the end pages will serve to enlarge the field of research into the methodology and practice of this professional occupation. The List of Definitions used in the discussions should also help the non-professional town planner to become familiar with the terminology commonly employed in this particular field of work.

List of Definitions

- 156 Access — the means to approach, enter or leave.
- Aesthetics — visual attractiveness as based on subjective appreciation of physical appearance.
- Arterial Thoroughfare — provides for traffic movements between areas and across portions of the city; allows for direct service to principal generators.
- Blight — decay in urban areas due to structural deterioration or to overloaded utilities.
- Bonuses — extra building capacities permitted in exchange for urban amenities.
- Building Height — vertical distance measured from the established grade to the highest point of roof surface for flat roofs, and to the midpoint between eave and ridge for sloping roof.
- Bulk — size, mass and shape of buildings and their positioning on the land.
- CBD — central business district, associated with the highest land values and densities.
- Circulation — the activity whereby people and goods are moving from a point of origin to a destination.
- Channelized Intersection — one which provides at grade controlled turning and crossing movements.
- Cloverleaf — a grade separated interchange which provides for all turning movements to and from intersection thoroughfares of near equal importance.
- Collector Street — provides for traffic movements between arterial thoroughfares and local roads including access to abutting properties.
- Community — a group of people bonded through spatial, political, economic, or social association. The term may also refer to the environmental unit in which these people live.
- Community Facility — a facility provided for common utilization by a community of which the purpose is to enhance the quality of life.
- Conforming Use — a development of land which is compatible with zoning restrictions.
- Covenant — legal restriction imposed on the use of a land parcel by a previous owner or public authority.
- Demography — the statistical study of human populations in terms of size, composition, distribution, change, etc.
- Development — change in use of land which usually includes construction activities.
- Diamond Interchange — provides for all turning movements and grade-separated through traffic for two crossing thoroughfares, where one is a greater importance than the other.
- Directional Interchange — provides for direct turning movements on separate roadways using extra structures.
- Dormitory — a residential area in which there are no commercial or industrial activities.
- Easement — a right to use private land, for a specified purpose in the public interest.
- Expropriation — a legal procedure whereby a public authority claims privately held land for public use with compensation to the owner.
- Floor Area Ratio (FAR) — ratio of the total floor area of a building to the total lot area (used in the U.S.A.).
- Floor Space Index (FSI) — ratio of the total floor area of a building to the total lot area (used in Canada).
- Freeway — provides for long-distance high-speed movements of large volumes of through traffic.
- Grouping — the location of structures within an overall concept and with organized interrelationships between individual units.
- Impact — the effect of a development, action, policy or program. It may be expressed through economic, social, political, or physical reaction.
- Interchange — the convergence of roadways where at least one of the roadways is not at-grade.
- Intersection — the junction of roadways at-grade.

- Labour Demand — the requirement for manpower in the labour force.
- Labour Supply — the manpower available for any and all sectors of the labour market.
- Land Use — spatial distribution of city functions.
- Land Use Intensity — overall structural mass and open space relationship in a developed property.
- Land Use Capacity — a use capable of producing an economic return (should not be in conflict with overall plans).
- Loading — the placement of passengers or cargo onto a vehicle in preparation for transport.
- Local Street — provides for direct access to abutting land, and for traffic movements connecting to collector and/or major streets.
- Mall — where vehicular traffic is highly restricted and pedestrian environment is improved.
- Mansard — roof top use with windows cut into the roof.
- Massing — where structures are organized into an overall concept to please the viewer and to introduce building volumes in an orderly fashion.
- Meter (parking) — a coin-operated timing device used to control the duration of on-street parking at designated parking spots.
- Milieu — refers to urban environment, commonly used French word.
- Multi-level Interchange — provides for controlled traffic movements of interconnecting thoroughfares of major importance.
- Multi-level Traffic Separation — segregation of transport vehicles, transit facilities and pedestrian movements onto various individual levels.
- Nuisance — prevailing condition or activity which has a detrimental effect on living conditions.
- Non-conforming Use — a development of land which is not compatible with zoning regulations but may be tolerated with certain restrictions.
- Parking — storage of a vehicle when not in use.
- Parkway — a thoroughfare with scenic qualities, controlled accesses, speed limits and restricted to passenger vehicles.
- Pedestrian — any person afoot, journeying from point A to B.
- Plaza — an area assigned to pedestrian use which does not alter the existing vehicular movement.
- Population Base — the composite population of an area.
- Population Density — total number of persons concentrated within a defined area; measure of the designed human capacity of urban land.
- Projection — the estimation of the future state of some variable, e.g. the economy, the population, etc.
- Public Amenity — a convenience or non-essential facility provided to enhance the quality of life.
- Public Hearing — general civic presentation and debate of a specific planning concept.
- Region — an area defined on the basis of political, economic, social or physical homogeneity. In town planning it is understood to refer to an area larger than a community but no larger than a nation.
- Rights of Way — public owned land parcel for the purpose of roads or public utilities.
- Rotary Intersection — a circulatory movement of vehicles around an island providing access to two or more roads of equal importance.
- Sectoral Distribution — the distribution of the labour force into general categories, e.g. service, manufacturing, professional, technical, etc.
- T-shaped Intersection — a junction whereby one roadway terminates at right angles to another through roadway.
- Tax Base — market value of realty holdings forming the basis for municipal revenue assessments.
- Thoroughfare — a roadway on which traffic has the right-of-way.
- Unloading — the removal of passengers or cargo from a vehicle at a destination following transport.
- Value — individually or collectively held worth which is based on needs, wants, beliefs, or traditions.
- Vehicle — any conveyance or means of land transportation other than that of walking.
- Zoning By-Law — regulations of land use and the types of structures allowed in each designated area. (Used in Canada).
- Zoning Ordinance — regulations of land use and the types of structures allowed in each designated area. (Used in U.S.A.).

Appendix 2

Checklists

158 The following lists are prescribed for the assistance of those involved in assessing certain prevailing conditions and various requirements in connection with the selection or use of a particular site for a federal project.

The checklists are not to be used as a mechanical solution to complex problems, but applied as a means of achieving good siting and proper functioning.

SITE CONDITIONS

Surface Features

Topography — general rise and fall of slope of the site.

Vegetation, overburden.

Surface water, river, creek, lake, ocean, pond marsh, tidal flat or areas that have seasonal flooding.

Rock outcrop.

Existing buildings — age, type, size and location.

Subsidence, erosion.

Subsurface Features

Depth of water table.

Foundations conditions (determined by boring).

Sequence of the strata.

Extent and description of each soil.

Depth and description of bedrock.

Occurrence of earthquakes.

Homogeneity of subsurface.

Climatic Information for Design Purposes

Precipitation: rain, snow.

Seasonal temperature.

Hours of sun.

Prevailing winds.

SITE SELECTION — PHYSICAL CONDITIONS

Functional Locations

Is it convenient for the users served?

Is it convenient for employees?

Does it meet the client's location requirements?

Size and Shape

Should meet the minimum sizes stated by the client (area, frontage, depth).

Should meet the minimum size with required setbacks, front, side and rear, as stated by the city, for the proposed use.

Should allow for possible future expansion if reservation of extra land is economical.

Topography

Site should be as level as possible.

Elevation should be at or above street grade to minimize fill.

Site should be properly drained to ensure against flooding.

Subsurface Conditions

Subsurface should be investigated to ensure suitable soil conditions, suitable bedrock, acceptable water table, and proper foundations.

Site Conflicts

Check for possible site encroachments such as roads and right-of-way, easements such as powerlines, water, sewer, gas, etc. Site should be free of offensive noise, air, water or visible pollution.

SITE SELECTION — TECHNICAL/LEGAL CRITERIA

Availability in the Required Time

It is preferable to negotiate the purchase of the land from the owner rather than be forced to resort to expropriation measures. Site must be cleared and available for commencement of construction work on the required date.

General Compliances

Proposed site use should conform to local zoning regulations. The proposed development should conform to the masterplan for the area and to the surrounding developments — existing and/or planned.

Encumbrances

Site shall be free of interfering encumbrances, such as easements, liens, deeds, rights to access, etc.

Services and Utilities

Site must be serviced or serviceable with all essential services, such as water, storm and sanitary sewerage or septic tank, electricity, telephone, fire and police protection.

Accessibility

Site must be accessible to all users and employees by the most convenient means of transportation available to them. Accessible to public transportation, pedestrians via sidewalks, private transportation, parking areas, delivery vehicles, etc. Avoid conflicts in traffic circulation on the site and in the surrounding area.

SITE SELECTION — ECONOMIC CRITERIA

Site Acquisition Costs

Should be acceptable and reasonable given current market conditions (includes buying existing leases).

Site Development Costs

These costs include removal of existing buildings, landscaping, servicing, etc.

Building Costs

Include all costs involved in building construction, including footings. All building costs should be calculated on a per-square-foot basis.

Feasibility Study

The final assessment should show that discounted yearly rental income will pay for the building costs (investment value).

Land Appreciation

Some indication should be given as to the property appreciation in 5, 10, 15 and 20 years. This can be determined by assessing the potential and direction of future growth in the area.

SITE SELECTION — SOCIAL/ENVIRONMENTAL CRITERIA

Compatibility

Should relate to and enhance existing community features or functions. Should conform to local values, attitudes and sentiments.

Natural Amenities

Proposed development should take into consideration natural features, such as vegetation and pleasant views or vistas and the ecological impact of the development on the surrounding area.

Public Relations Value

The site selected should be agreeable to the general public.

Site development should be attractive and modern and reflect a good image of the federal presence in the community.

Private Transportation

Ensure that there is adequate on-site parking or off-street parking in a nearby area.

Passenger loading and unloading areas, should be provided, if possible.

There should be good access to surrounding road system.

Minimize on-site conflicts with other modes of transportation.

Provide service and loading areas for delivery vehicles.

Public Transportation

Locate building entrances in the direction of nearest stop station.

Provide enclosed waiting areas on the site or landscaped waiting areas with adequate trees, shrubs and benches.

Provide for on-site circulation if the size of site and number of users warrant it.

Pedestrian Transportation

Pedestrian transportation systems should be distinctly separated from motor vehicles.

Should join the functional areas of the site such as buildings, parking areas, and passenger loading areas.

OFF-SITE TRANSPORTATION REQUIREMENTS

Private Transportation

Should be adequate to serve the employees and users of the site.

Should have a minimum degree of congestion at the outset and in the future.

Public Transportation

Select locations that have an adequate existing service.

Ask the transportation authorities to increase or improve the service if no suitable sites can be found with an existing and adequate service.

Pedestrian Transportation

Adequate sidewalks should be provided in the area if employee and site users require it.

Protected crossings of roads must be established where they are warranted.

ENVIRONMENT REQUIREMENTS

Survey the area surrounding the site and determine the general environment. It should fall into one or more the following environment categories.

Rural (Natural) — Rural land left in its natural state. Examples are, open grassland or prairie, marshes, forest or bush, or combinations of these.

Rural (Cultivated) — Rural land which is being used for agricultural purposes.

Rural (Urban Peripheral) — Rural land bordering on the edge of urban areas. It could be in its natural state or cultivated.

Residential (Undeveloped) — Land slated for future residential use.

Residential (Partly Developed) — Surrounding land is slated for residential use and only part of the land has houses on it.

Residential (Developed)

Low density — Main land use is single — family dwellings.

Medium density — Dominant land use is multiple family homes, semi-detached houses, or 2- and 3-storey apartments.

High density — Main land use is high-rise apartments.

Government (Public) — Surrounding area is used for government purposes, such as Armed Forces, laboratory, post office, general-purpose office building and municipal buildings.

Park (Recreational) — Designates an area that is used for active recreation, such as a golf course, playground, athletic field or for passive recreation such as a zoo, botanical garden or national park.

Light Industrial — Is applied to land uses, such as truck terminals, warehouses and manufacturers of items, such as glass products, light metals, furniture, plastics, etc.

Heavy Industrial — Characterizes land uses, such as oil refineries, railway shops, metal foundries, scrap yards, meat packers and manufacturers of items such as chemicals and fertilizer, etc.

Industrial Park — A planned industrial area with lots of varying size operations designed for modern industrial activities. These parks often have common facilities, such as recreation and park areas and control over architectural design of structures. Industrial activities which generate offensive bi-products are not permitted in industrial parks.

Warehouse Storage — Large industrial-type buildings used for storing products for manufacturers, wholesalers or freight.

Transport Oriented

Rail — This category is used if a railway track or railway yard is an important feature of the environment.

Air — This category is used if an airport or an airport flight path is an important feature of the environment.

Water — If wharfs, harbour facilities or water transportation are part of the environment, this category is used.

Road — If a major street, highway or traffic interchange affects the site, this category is used.

Institutional — Used to describe public land uses, such as hospitals, libraries, churches, schools, civic centres and campuses.

Parking (Auto Oriented) — Vehicle storage areas.

Central Business District — A central area of the town in which the principal shops, offices, civic buildings and places of cultural entertainment and amusement are concentrated.

Local Commercial — Characterized by convenience stores which serve neighbourhood needs such as drug stores, small grocery store, dry cleaner, etc.

Regional Commercial — Commercial facilities which draw customers from a large area. Examples are car dealer, theatre, sub-urban department stores and shopping centres.

Highway Commercial — Commercial facilities located on highway frontage and where services are oriented towards vehicular access. Examples are service stations, drive-in restaurants, motels and businesses that sell heavy equipment or farm machinery.

Scenic — An area containing physical attractions and/or natural beauty.

Potential New Development — Used if the surrounding area is located in the direction of immediate future growth.

Checking for Compatibility

New use of a site should be compatible with the existing environment categories. (For details, see *Functional Relationship*, Chap. 2).

Determine main functions and activities of the new use.

Analyse new functions and determine their interactions with the environment.

Identify and separate the functions that are in conflict with the proposed use of the site.

Establish the impact of the functions and decide if they are acceptable for the environment.

Lessen any adverse impact or eliminate completely.

Natural Resources Inventory

An inventory of natural resources of the site and the surrounding area should also be taken by qualified personnel if this measure appears to be necessary. The inventory should include a relevant record of any or all of the following resources:

Flora — type, size, quantity and quality.

Fauna — species and quantity.

Geology — significant features, such as hills, valleys, old lake or river plains, deltas, etc.

Surface water — lakes, rivers, oceans, swamps, etc. and their value for recreation, amenity and ecology.

Other outstanding physiography.

SERVICE REQUIREMENTS

Public Services

Adequate police and security, fire protection, recreation facilities, cultural facilities, health facilities, school facilities and church facilities.

Utilities

Water Supply

Site demands, present and future.

Capacity of the municipal system or of the on site source.

Sanitary Sewer

Site demands, present and future.

Capacity of the surrounding municipal system or of the on-site treatment plant or septic tank.

Storm Sewers

Site demand present and future.

Capacity of the surrounding municipal system or of the site's system.

Electrical Power

Site demands, present and future.

Capacity of on-site generators.

Capacity of the surrounding power system. Transformers (if any) required.

Gas Mains

Site demands, present and future.

Capacity of the closest gas line.

Telephone Service

Site's demand, present and future.

Capacity of the surrounding telephone system.

Physical Characteristics

Subsurface Conditions — Soil type, bedrock type, bedrock faults and water table.

Topography — Slopes, grades, surface drainage — (perennial, semi-perennial, occasional) — flood potential, subsidence and erosion.

Vegetation — Trees, overburden, clearance and demolition and man-made development.

Size and Shape of Lot

Suitability of Lot — Frontage of lot, depth, total area and usable area.

Functional Location

Relationship of — Various functions, to public, customers and business interests.

Compatible Environment

Natural Amenities — Strategic location, view, and sentimental, historic, aesthetic or local values.

Zoning — Original, existing and projected.

Land Use — Conformity, restrictions and projections.

Surrounding Areas — Existing development, quality and condition and possible conflict.

Projected Development Potential — aesthetics, health and safety considerations and advertising potential.

Site Selection

Characteristics of alternate locations.
Factors for selecting present site.
Evaluation of selection.

General Accessibility

Circulation — Arterials, local approaches, volume of traffic, commercial traffic, road capacities, peak volumes, individual accesses, turning movements and speed limits.

Projected traffic pattern, general air, water, train accesses (if applicable) in terms of passengers and freight.

Public Transportation

Routes, capacities, projections and loading/unloading.

Private Transportation

Site access, parking areas, loading/unloading and pedestrian movements.

Service and Utilities

Public Services — Church, school, health, cultural, recreational, fire protection, police and security.

Air, Rail, Water Accesses (site only) — Special requirements, capacities and right(s) of way.

Utilities — Piped water, sanitary and storm sewers, electrical-power, chilled water, energy and heating — (steam, fuel, gas) — postal services, cargo services and telephone.

Property and Assessment

Property — Ownership, acquisition costs, present value*, easement, caveats, projected values* and future potential*. (* These require involvement of qualified local real estate appraiser.)

Expansion

Areas of systematic expansion, access-
es and utilities.

Aesthetic considerations.

Development controls and restrictions:
height
density
setback
clearance
appearance
special permits

Functional Aspects

Waste disposal

Unightly aspects

Site utilization and organization

Nuisances

- odor
- fumes
- smoke
- noise
- electrical interference
- vibration
- radioactivity, etc.

Special storage facilities

Special utilities

Availability of:

- work force
- residential accommodation
- Other special requirements

Summary & Conclusions

Final assessment will comment on:

- site selection
- design solution
- site utilization
- functional shortage
- future expansion
- projected value
- environmental relationship

PROJECT OUTLINE

Program

Project

Objective

Background

- Definitions
- Criteria
- Operation Organization
- Constraints
- Priorities
- Other Information

Project Content

- Geographical Scope
- Work Involved
- Time and Cost Schedule
 - duration
 - estimated Costs

Project Budget

Files

Practical Interpretations

The *site conditions* list is used for assessing the physical conditions of a particular site.

The *site selection* lists present the various town planning site selection criteria to be considered. Various sites may be compared and contrasted on the same basis (See *Site Selection*, Chap. 4).

The *transportation requirements* lists offer various aspects of circulation which are to be satisfied to ensure proper accessibility of a particular site.

Environment requirements are listed to assist in making decisions as to whether or not a particular activity would fit into a certain surrounding.

The list of *service requirements* provides various criteria that must be applied to ensure satisfactory servicing a particular site.

The *project appraisal* list covers all important considerations necessary for a full town planning appraisal of a project complete and in use for some time.

The *project outline* lists the principal characteristics and data of a particular project.

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